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ABSTRACT

This report provides comprehensive data on the level of access by Americans to telephones, computers, and the Internet. It also provides valuable information about where Americans are gaining access and what they are doing with their online connections. These data, from the U.S. Census, provide a factual foundation for key policy initiatives to promote greater access for all Americans. Access to the Internet has soared for people in all demographic groups and geographic locations. At the end of 1998, over 40% of all U.S. households owned computers, and one-quarter of all households had access to the Internet. However, the digital divide persists between the information rich and the information poor, who include younger people, those with lower incomes and education levels, certain minorities, and those in rural areas or central cities. Whites are more likely to have access to the Internet from home than Blacks or Hispanics are from any location. Black and Hispanic households are approximately one-third as likely to have home Internet access as households of Asian/Pacific Islander descent and roughly two-fifths as likely as White households. Regardless of income level, Americans in rural areas lag in Internet access. At the lowest income levels, those in urban areas are more than twice as likely to have Internet access than those earning the same income in rural areas. For many groups, the digital gap has widened. An appendix contains information about the trendline study through 1998. (Contains 113 charts and 5 tables.) (SLD)

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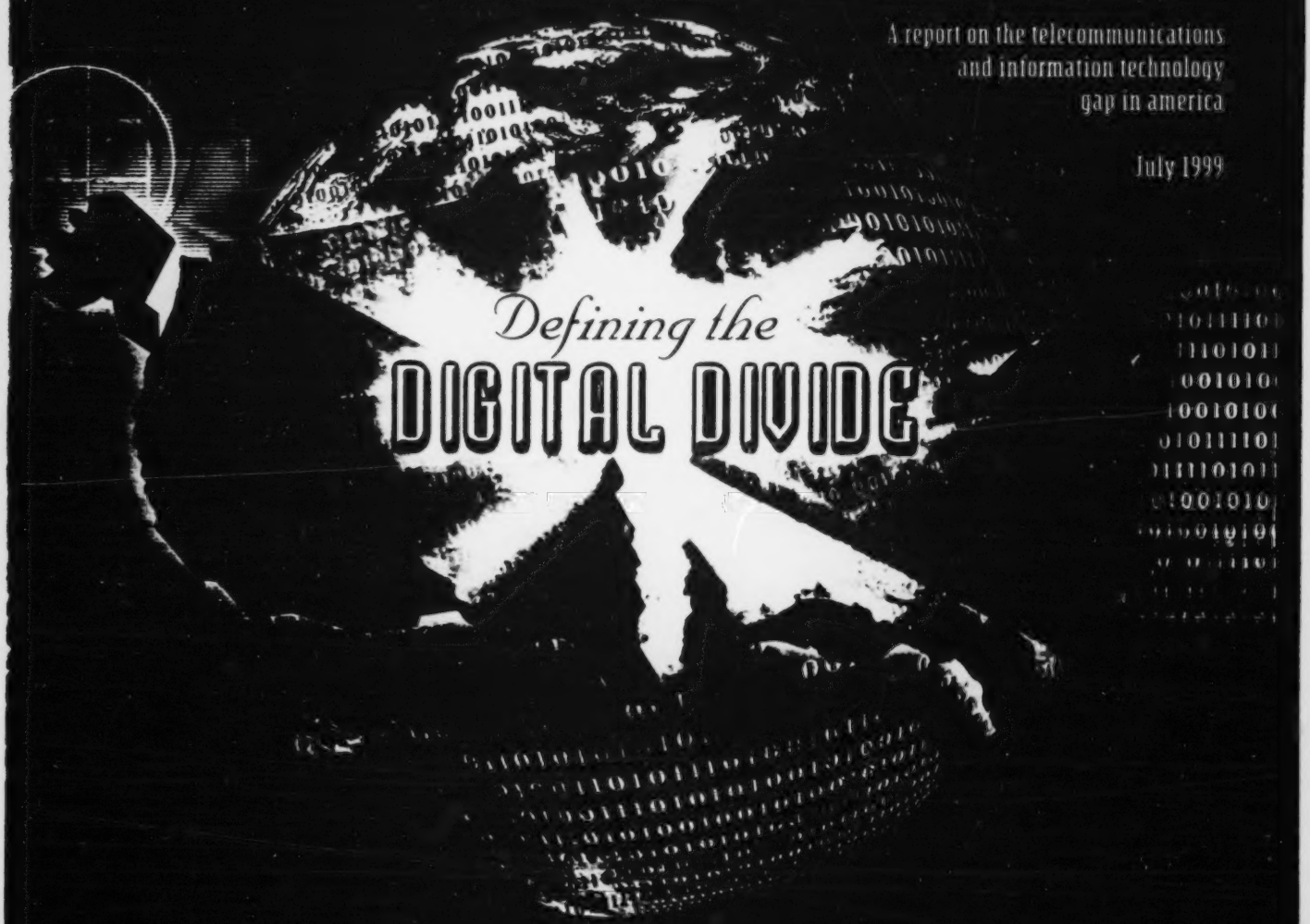
Falling Through The Net

A report on the telecommunications and information technology gap in america

July 1999



Defining the DIGITAL DIVIDE

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National Telecommunications and Information Administration

Revised 11/99

The full report, additional charts, and links to the original Census data and survey instrument are available on NTIA's web site at *www.ntia.doc.gov*, or from NTIA's Office of Public Affairs, (202) 482-7002.

See also the Department of Commerce main web site, *www.doc.gov* for other reports on information technology and electronic commerce.

FALLING THROUGH THE NET: DEFINING THE DIGITAL DIVIDE

A Report on the Telecommunications and Information Technology Gap in America

July 1999

National Telecommunications and Information Administration • U.S. DEPARTMENT OF COMMERCE

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

With the emerging digital economy becoming a major driving force of our nation's economic well-being, we must ensure that all Americans have the information tools and skills that are critical to their participation. Access to such tools is an important step to ensure that our economy grows strongly and that in the future no one is left behind.

Falling Through the Net: Defining the Digital Divide is an important part of the Commerce Department's efforts to understand, measure, and explain how the information revolution is affecting the nation. The report provides comprehensive data on the level of access by Americans to telephones, computers, and the Internet. It also provides valuable information about where Americans are gaining access and what they are doing with their online connections. The report provides the factual foundation for key policy initiatives to promote greater access for all Americans.

While we know that Americans are more connected to digital tools than ever before, the report provides evidence that the "digital divide" between certain demographic groups and regions of our country continues to persist and in many cases is widening significantly. We should be alarmed by this news.

Ensuring access to the fundamental tools of the digital economy is one of the most significant investments our nation can make. Our country's most important resource is its people. Our companies are only as good as their workers. Highly-skilled, well educated workers make for stellar businesses and create superior products. In a society that increasingly relies on computers and the Internet to deliver information and enhance communication, we need to make sure that all Americans have access. Our domestic and global economies will demand it. Ready access to telecommunications tools will help produce the kind of technology-literate work force that will enable the United States to continue to be a leader in the global economy.

This report complements the Department of Commerce's reports on *The Emerging Digital Economy* and on the information technology work force challenges, *The Digital Dilemma: Building Infotech Skills at the Speed of Innovation.*

Both the government and the private sector must embrace policies and initiatives that bridge the divide. We look forward to working with the private sector to bring the riches of the Information Age to everyone.

William M. Daley

FALLING THROUGH THE NET: DEFINING THE DIGITAL DIVIDE

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INTRODUCTION

Larry Irving
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NTIA is pleased to release *Falling Through the Net: Defining the Digital Divide*. This is our third report examining which American households have access to telephones, computers, and the Internet, and which do not. The "digital divide" — the divide between those with access to new technologies and those without — is now one of America's leading economic and civil rights issues. This report will help clarify which Americans are falling further behind, so that we can take concrete steps to redress this gap.

Overall, we have found that the number of Americans connected to the nation's information infrastructure is soaring. Nevertheless, this year's report finds that a digital divide still exists, and, in many cases, is actually *widening* over time. Minorities, low-income persons, the less educated, and children of single-parent households, particularly when they reside in rural areas or central cities, are among the groups that lack access to information resources.

Part I of this report surveys household access to telephones, computers, and the Internet, updating the surveys in our previous two reports: *Falling Through the Net: A Survey of the "Have Nots" in Rural and Urban America* (July 1995) and *Falling Through the Net II: New Data on the Digital Divide* (July 1998). We find that, although more households are connected, certain households are gaining access to new technologies far more quickly, while others are falling further behind.

Part II provides significant new information on individual Internet usage. Among other things, we look at how people are connected to the Internet; where people access the Internet outside the home (such as at work, school, a library, or a community center); how Americans choose to spend their time online; and why some people are not connected. We find that certain people are more likely to have Internet access, especially at home or work. Some of those who lack such access, however, are using the Internet at public facilities, including schools and libraries, and are using the Internet in ways that will help them advance economically and professionally.

Part III discusses the challenges ahead in solving the digital divide and highlights the significance of several key policies in promoting access. In the Appendix to this report, we also provide a "Trendline Study" depicting the trends in household telephone, computer, and Internet access at various points since 1984. This historic survey adds critical information regarding how far we have come in the last fourteen years, and how far we have yet to go in connecting Americans to critical information resources.

The report provides a wealth of information that can be used by policymakers, researchers, industry, academics, and the general public. We have tried to present much of the critical data in comprehensible charts and tables. The entire range of U.S. Department of Commerce Census Bureau data, however, is too vast to summarize within the confines of one report. Additional charts, a link to the original Census data, and the survey instrument can be obtained through NTIA's web site at *www.ntia.doc.gov*, or you may contact NTIA's Office of Public Affairs at (202) 482-7002 for further information.

We hope that this data will provide the basis for further discussion about ways to make information resources available to all Americans. As we enter the Information Age, access to information resources will be increasingly critical to finding a job, contacting colleagues, taking courses, researching products, or finding public information. Determining who has access to these resources is a critical first step towards closing the digital divide and ensuring that no group continues to fall through the Net.

EXECUTIVE SUMMARY

Information tools, such as the personal computer and the Internet, are increasingly critical to economic success and personal advancement. *Falling Through the Net: Defining the Digital Divide* finds that more Americans than ever have access to telephones, computers, and the Internet. At the same time, however, NTIA has found that there is still a significant "digital divide" separating American information "haves" and "have nots." Indeed, in many instances, the digital divide has *widened* in the last year.

This report, NTIA's third in the *Falling Through the Net* series, relies on December 1998 U.S. Department of Commerce Census Bureau data to provide an updated snapshot of the digital divide. The good news is that Americans are more connected than ever before. Access to computers and the Internet has soared for people in all demographic groups and geographic locations. At the end of 1998, over 40 percent of American households owned computers, and one-quarter of all households had Internet access. Additionally, those who were less likely to have telephones (chiefly, young and minority households in rural areas) are now more likely to have phones at home. (Chart I-1)

Chart I-1

Accompanying this good news, however, is the persistence of the digital divide between the information rich (such as Whites, Asians/Pacific Islanders, those with higher incomes, those more educated, and dual-parent households) and the information poor (such as those who are younger, those with lower incomes and education levels, certain minorities, and those in rural areas or central cities). The 1998 data reveal significant disparities, including the following:

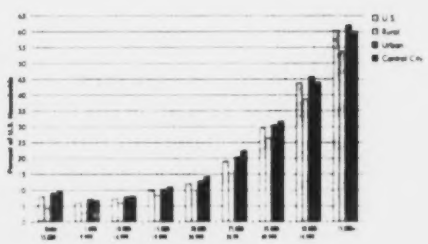

Chart I-21

- Urban households with incomes of $75,000 and higher are more than *twenty times* more likely to have access to the Internet than rural households at the lowest income levels, and more than *nine times* as likely to have a computer at home. (Chart I-21)

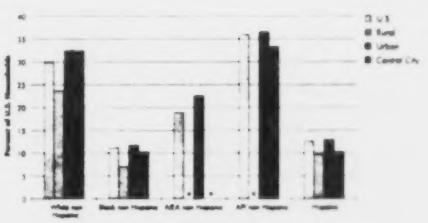

Chart I-22

- Whites are more likely to have access to the Internet from home than Blacks or Hispanics have from *any* location.
- Black and Hispanic households are approximately *one-third* as likely to have home Internet access as households of Asian/Pacific Islander descent, and roughly *two-fifths* as likely as White households. (Chart I-22)
- Regardless of income level, Americans living in rural areas are lagging behind in Internet access. Indeed, at the lowest income levels, those in urban areas are more than twice as likely to have Internet access than those earning the same income in rural areas.

For many groups, the digital divide has *widened* as the information "haves" outpace the "have nots" in gaining access to electronic resources. The following gaps with regard to home Internet access are representative:

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- The gaps between White and Hispanic households, and between White and Black households, are now approximately five percentage points larger than they were in 1997. (Chart I-23)
- The digital divides based on education and income level have also increased in the last year alone. Between 1997 and 1998, the divide between those at the highest and lowest education levels increased 25 percent, and the divide between those at the highest and lowest income levels grew 29 percent.

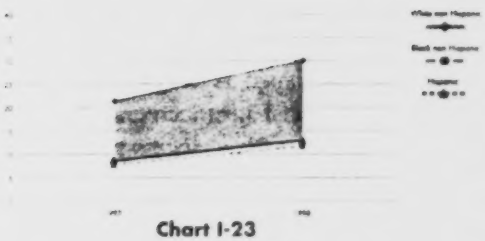

Chart I-23

Nevertheless, the news is not all bleak. For Americans with incomes of $75,000 and higher, the divide between Whites and Blacks has actually narrowed considerably in the last year. This finding suggests that the most affluent American families, irrespective of race, are connecting to the Net. If prices of computers and the Internet decline further, the divide between the information "haves" and "have nots" may continue to narrow.

Until every home can afford access to information resources, however, we will need public policies and private initiatives to expand affordable access to those resources. The Clinton Administration is committed to connecting all Americans to the National Information Infrastructure. Pro-competition policies, to reduce the prices of basic phone and information services, and universal service policies will continue to be important parts of the solution.

Community access centers (CACs) — such as schools, libraries, and other public access points — will play an important role. The 1998 data demonstrate that community access centers are particularly well used by those groups who lack access at home or at work. These same groups (such as those with lower incomes and education levels, certain minorities, and the unemployed) are also using the Internet at higher rates to search for jobs or take courses. Providing public access to the Internet will help these groups advance economically, as well as provide them the technical skills to compete professionally in today's digital economy.

Establishing and supporting community access centers, among other steps, will help ensure that all Americans can access new technologies. As we enter the Information Age, access to computers and the Internet is becoming increasingly vital. It is in everyone's interest to ensure that no American is left behind.

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METHODOLOGY

This report profiles trends in access and usage of U.S. telephones, computers, and the Internet. NTIA's first report, *Falling Through the Net: A Survey of the "Have Nots" in Rural and Urban America* (July 1995), was the first survey of its kind regarding household computer and modem ownership by degree of urbanization. NTIA's second report, *Falling Through the Net II: New Data on the Digital Divide* (July 1998), presented updated data regarding household telephone and computer ownership, but focused on household on-line access instead of modems. This third survey, *Falling Through The Net: Defining the Digital Divide*, further defines the digital divide, and provides new information on Internet access and usage.

As in our previous reports, we utilize data from the U.S. Department of Commerce Census Bureau. NTIA contracted with the Census Bureau to add questions to its December 1998 "Current Population Survey" ("CPS") on household penetration, specifically to formulate a Computer and Internet Use Supplement survey. This survey asked additional questions regarding points of Internet access, methods of access, types of use, and reasons for discontinuing use, among other topics. All respondents were at least fifteen years old, knowledgeable about the Internet or computers, and gave proxy responses for other members of the household.

The Census Bureau obtained data on these surveys by interviewing 48,000 sample households. The CPS and Computer and Internet Use Supplement samples were selected from the 1990 Decennial Census files with coverage in all fifty states and the District of Columbia. The sample is continually updated to account for new residential construction. The Census Bureau divided the United States into 2,007 geographic areas, each typically comprised of a county or several contiguous counties. It selected a total of 754 geographic areas for the 1998 CPS survey.

As in 1994 and 1997, the Census Bureau cross-tabulated the information gathered according to specific variables, such as income, race, education level, household type, and age as well as by geographic categories, such as rural, urban, and central city, plus state and region. NTIA adopted these categorizations in presenting information in the attached charts. The Census Bureau determined that some of the data were statistically insignificant for any meaningful analysis because they were derived from small samples. We have noted this, where appropriate, in the charts.

All statistics are subject to sampling error, as well as non-sampling error such as survey design flaws, respondent classification and reporting errors, data processing mistakes and undercoverage. The Census Bureau has taken steps to minimize errors in the form of quality control and edit procedures to reduce errors made by respondents, coders, and interviewers. Ratio estimation to independent age-race-sex-Hispanic population controls partially corrects for bias attributable to survey undercoverage. However, biases exist in the estimates when missed people have characteristics different from those of interviewed people in the same age-race-sex-Hispanic group.

NTIA used Census data to create its own cross-tabulation references throughout the report. We also conducted a logistic regression to evaluate how race, income, degree of urbanization, education, and access to a computer at home, influence Internet usage through a library or community center.

$$PUBACCESS = \alpha + \beta_1 LOWINCOME + \beta_2 BLACK + \beta_3 HISPANIC + \beta_4 MINORITIES + \beta_5 NOSUBURB + \beta_6 NOCOMPUTER + \beta_7 NOCOLLGRAD$$

The variables are binary and defined as follows: PUBACCESS is Internet usage at a public library or community center; LOWINCOME is a household with annual income less than $20,000; BLACK is Black non-Hispanic; HISPANIC is Hispanic, any race; MINORITIES is minority, non-Black, non-Hispanic; NOSUBURB is central city or non-metropolitan (rural); NOCOMPUTER is no computer in the household; NOCOLLGRAD is no four-year college degree. The logistic regression analyzes how changes in the above variables affect the probability of a person utilizing a library or community center for Internet access. Because of the binary nature of PUBACCESS, (i.e., either individuals get access to the Internet from a public library or community center or they do not), the logistic regression technique is well suited for this study of the Census data.

PART I

HOUSEHOLD ACCESS

A. INTRODUCTION

Over the last five years, NTIA has measured household connectivity as a means of determining which Americans are connected to the nation's telecommunications and information infrastructure. Part I updates the earlier household penetration surveys released in NTIA's *Falling Through the Net: A Survey of the "Have Nots" in Rural and Urban America* (July 1995) and *Falling Through the Net II: New Data on the Digital Divide* (July 1998).[1] As in our earlier surveys, we have measured household telephone, computer, and Internet penetration rates across America to determine which Americans own telephones and personal computers (PCs) and access the Internet at home.[2]

The 1998 data reveal that, overall, U.S. households are significantly more connected by telephone, computer, and the Internet since NTIA issued the first *Falling Through the Net* report, which was based on 1994 Current Population Survey (CPS) results.[3] (Chart I-1) Penetration rates have risen across all demographic groups and geographic areas. Nevertheless, penetration levels currently differ — often substantially — according to income, education level, race, household type, and geography, among other demographic characteristics. The differences in connectivity are most pronounced with respect to computers and Internet access.

The following examples highlight the breadth of the digital divide today:

- Those with a college degree are more than *eight times* as likely to have a computer at home, and nearly *sixteen times* as likely to have home Internet access, as those with an elementary school education.
- A high-income household in an urban area is more than *twenty times* as likely as a rural, low-income household to have Internet access.
- A child in a low-income White family is *three times* as likely to have Internet access as a child in a comparable Black family, and *four times* as likely to have access as children in a comparable Hispanic household.
- A wealthy household of Asian/Pacific Islander descent is nearly *thirteen times* as likely to own a computer as a poor Black household, and nearly *thirty-four times* as likely to have Internet access.

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[1] Households were asked the same survey questions to permit easy comparison of penetration rates across the last five years. The Trendline Study in the Appendix to this report provides a historic overview, comparing penetration rates for certain categories since 1984. We have provided nearly identical tabulations and charts for these surveys.

[2] Part II of this report expands on the earlier reports by examining Internet access at sources outside of the home, as well as other Internet-related issues. A number of other studies have been developed on the subject of U.S. households' electronic access to information. See, e.g., Susan Goslee (1998), LOSING GROUND BIT BY BIT: Low-Income Communities in the Information Age, Benton Foundation; Donna L. Hoffman & Thomas P. Novak, "The Evolution of the Digital Divide: Examining the Relationship of Race to Internet Access and Usage Over Time," a paper presented at the conference, "Understanding the Digital Economy: Data, Tools and Research," May 25-26, 1999 (forthcoming); Robert Kraut et al. (1996), "HomeNet: A Field Trial of Residential Internet Services," ACM Research; Shelley Morrisette et al. (1999), "Consumers Digital Decade," Forrester Research, Inc. <www.forrester.com>; U.S. Internet Council (1999), State of the Internet: USIC's Report on Use & Threats in 1999 <www.usic.org>; and Anthony Wilhelm (1998), Closing the Digital Divide: Enhancing Hispanic Participation in the Information Age, The Tomas Rivera Policy Institute.

[3] As discussed in the "Methodology" section, the Census Bureau collected CPS supplemental data on telephones, computers, and Internet use by conducting interviews of 48,000 sample households (57,000 in 1994). Significant advantages of the Census approach relative to others include its scientifically selected large sample and the employment of home visits by interviewers rather than strict reliance on telephone surveys, thereby reaching important households (e.g., those without telephones) that otherwise would likely be missed.

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- Finally, a child in a dual-parent White household is nearly *twice* as likely to have Internet access as a child in a White single-parent household, while a child in a dual-parent Black family is almost *four times* as likely to have access as a child in a single-parent Black household.

The data reveal that the digital divide — the disparities in access to telephones, personal computers (PCs), and the Internet across certain demographic groups — still exists and, in many cases, has *widened significantly*. The gap for computers and Internet access has generally grown larger by categories of education, income, and race.

These are just a few of the many disparities that persist across the United States today. As discussed below, however, the divide among households with telephones is narrowing. Certain gaps for computer ownership (between certain income and education levels) are also closing. As the following discussion explains, Internet access remains the chief concern, as those already with access to electronic resources make rapid gains while leaving other households behind.

B. TELEPHONE PENETRATION

As a mature technology, telephones are now a likely feature in most American homes. Unlike computer and Internet use, telephone penetration rates have generally stabilized (at about 94.%).[4] That stabilization, however, masks disparities that still exist among different demographic groups. Certain groups, such as low-income, young, and certain minority households, are still far less likely to own telephones than higher-income, older, or White or Asian/Pacific Islander households. These disparities are particularly noticeable in rural areas.

The good news is that the differential between traditional "haves" and "have nots" has decreased in recent years. For example, no group is more likely to own a telephone today than Black households earning $75,000 or more (traditionally less connected than White households at the same income level).

1. Stable Telephone Penetration

As noted, the 1998 data reveal that telephone penetration rates among households have changed little overall in the last few years. From 1994 to 1998, at-home telephone ownership in America has increased slightly from 93.8% to 94.1%. (Chart I-2) All geographic locations — whether rural, urban, or central city — have experienced a similar marginal growth, although central cities have continued to lag behind rural and urban areas. *Id.*

2. Disparities in Telephone Penetration

The likelihood of owning a phone still varies significantly, however, by the household's income, education level, race, age, or household makeup. Additionally, where a person lives can also greatly influence the likelihood of telephone ownership. While rural areas are generally as connected as urban areas, those groups that are less likely to own phones have especially low penetration rates in rural areas.

The following demographic and geographic breakdowns are particularly important determinants in household telephone penetration rates:

[4] This study does not track ownership of cellular telephones or other wireless devices. If prices continue to decline and these devices become substitutes for conventional wireline phones, then future household penetration studies should include both types.

Income. Generally, telephone penetration correlates directly with income. Only 78.7% of the lowest-income households (*i.e.*, less than $5,000 annually) have telephones. (Chart I-3) If you are poor and living in a rural area, a household's chances are approximately three out of four of owning a phone. At the opposite end of the spectrum, if a household earns more than $75,000 and is located in central city and urban areas, it is particularly likely (98.9%) to own phones. *Id.*

Race/Origin. Race and ethnic origin are also significant factors.[5] Approximately 95.0% of all White households have phones, regardless of where they live. (Chart I-4) This contrasts sharply with minority households, particularly those such as rural-dwelling American Indians/Eskimos/Aleuts (76.4%), Hispanics (84.6%), and Blacks (85.4%). *Id.*

The disparity based on race/origin is also affected by income level. At the highest income level ($75,000 or higher), there is virtually *no difference* among household penetration rates. (Chart I-6) At the lowest income level (less than $15,000) the disparities are pronounced: American Indians/Eskimos/Aleuts (72.3%), Blacks (78.1%), and Hispanics (81.9%) have the lowest penetration rates, compared to Asians/Pacific Islanders (90.9%) and Whites (89.1%). *Id.*

Education. As with income, the degree of phone ownership closely correlates with the level of education. For those with college degrees, the rate exceeds 97.0%. (Chart I-7) At the other end, those with only some high school education have the lowest penetration rates, particularly in central city areas (85.0%). *Id.*

Household Type. Whether one is married or has children also affects the likelihood of having telephone service. Married couples with children are particularly likely to have telephones (96.4%). (Chart I-8) Single parents with children have the lowest phone rates in this category: male-headed households in central cities (85.9%) fare worst, followed by female-headed households in rural areas (86.8%). *Id.*

Age. Seniors remain the most connected of all age groups by telephone (95.6%), with 45-54 year-olds following closely behind (95.4%). (Chart I-9) Households headed by those under 25 are the least connected (87.6%), with particularly low rates in rural (84.2%) and central city (87.7%) areas. *Id.*

Region. Viewed in the aggregate, there is little disparity in telephone penetration by region. The Northeast, Midwest, and West all have penetration rates of approximately 95.0%, although the South lags at 92.4%. (Chart I-10) The differences come into play when one looks at the location within a region. Rural areas in the Northeast (96.7%) and Midwest (96.0%) exhibit the highest telephone ownership rates. At the lowest end are the central cities in the Midwest and South (both 91.8%), followed by rural areas of the South (92.1%) and West (92.3%). *Id.*

State. State telephone penetration can be grouped by tiers (Table I-1).[6] In the high tier, Minnesota, North Dakota, Maryland, and others lead the way with rates of 96% or more. In the middle tier lies the

[5] Throughout the text of this report, we will use the terms "Whites," "Blacks," "American Indians/Eskimos/Aleuts," and "Asians/Pacific Islanders" as short-hand references to the full race/ethnic origins categories of "White non Hispanic," "Black non Hispanic," etc. There exists, of course, a separate "Hispanic" grouping. These categories were created to avoid double-counting Hispanics that could otherwise be classified under any or all of the above categories. A taxonomy with the full names appears in the charts that are part of this report, although American Indians/Eskimos/Aleuts and Asians/Pacific Islanders are abbreviated there ("AIEA non Hispanic," "API non Hispanic") to permit easy placement. In parts of the report and in some charts we reference "Other non Hispanic," a Census race/origin category that includes Asians/Pacific Islanders, American Indians, Eskimos, and Aleuts. When the collected sample for a given category is too small to permit a statistically significant finding (e.g., rural data for AIEA or API Internet use), we may aggregate the data at the "Other" level to achieve the desired reliability.

[6] Precise rankings cannot be assigned because in some cases, confidence intervals (i.e., positive or negative values that identify the range within which it is 90% certain that the true penetration number falls) do not permit a stable ranking system.

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majority of states, ranging from Ohio (95.8%) to Florida (92.3%). The low tier primarily contains southern states, with Oklahoma, Arkansas, and New Mexico exhibiting rates below 90%. *Id.*

To conclude, over the past five years, the aggregate level has remained virtually unchanged. However, closer inspection reveals that not all groups or regions have fared the same. If you are low-income, a minority, less-educated, a single parent with children, a young head of the household, or live in the South, then you are less likely to have a telephone at home. Households that belong to one of these groups and are located in a rural area or a central city, are likely to be among the least connected.

3. Closing Penetration Gaps

While there are still acute disparities among different demographic groups, the encouraging news is that certain disparities appear to be shrinking over time. The racial divide, for example, between Whites and Blacks, and Whites and Hispanics, has shrunk significantly between 1994 and 1998. In 1994, there was a 10.6 percentage point difference between telephone penetration rates in White and Black households. By 1998, that gap decreased (by 25.5%) to a 7.9 percentage point difference. Similarly, the White/Hispanic differential of 10.2 points in 1994 has decreased by 37.3% to a 6.4 percentage point gap in 1998.

Most of this closure has occurred just in the last year. In the period between 1997 and 1998, the White/Black household gap decreased by 20.2% (from a difference of 9.9 percentage points in 1997 to a gap of 7.9 percentage points in 1998), and the White/Hispanic household gap decreased by 31.9% (from a difference of 9.4 percentage points in 1997 to a gap of 6.4 percentage points in 1998). (Chart I-5)

The narrowing of the divide has not, however, occurred across all income levels or proceeded at similar rates. During the period between 1994 and 1998, the *White/Black divide* decreased most significantly for households at income brackets of less than $15,000: the racial divide shrunk by 37.5% (or 5.4 percentage points). The gap also shrunk by 8.5% (or .4 percentage points) for households earning between $15,000-34,999. In contrast, the White/Black gap for the $35,000-74,999 bracket *increased* during 1994-98, widening by 0.9 points (a growth of 52.9%).

The most surprising change has been at the highest income level of $75,000 or more: for that category, the phone penetration level for high-income Whites and Blacks is virtually the same (99.7% for Blacks, compared to 98.8% for Whites) (Chart I-61) Race has ceased to be a factor at the highest income level.

The *White/Hispanic divide* also varies by income level, but in all cases has declined between 1994 and 1998. For incomes less than $15,000, the gap between White and Hispanic households narrowed by 4.9 percentage points (shrinking by 40.5%). For incomes between $15,000-34,999, the divide closed by 2.1 percentage points (a change of 29.2%). Households earning incomes between $35,000-74,999, or more than $75,000, both experienced a marginal narrowing of 0.3 percentage points (a change of 21.4% and 33.3%, respectively).

In sum, the traditional divide besetting groups of telephone users has narrowed in many instances during the past several years. The gaps have been particularly reduced during 1997-98.

C. ACCESS TO ELECTRONIC SERVICES

While telephone penetration has remained stable across the nation, significant changes have occurred for personal computer ownership and Internet access. For the latter two categories, household rates have soared since 1994 for all demographic groups in all locations. These increases indicate that Americans across the board are increasingly embracing electronic services by employing them in their homes.

Despite increasing connectivity for all groups, in some areas the digital divide still exists and, in a number of cases, is *growing*. Some groups (such as certain minority or low-income households in rural America) still have PC and Internet penetration rates in the single digits. By contrast, other groups (such as higher-income, highly educated, or dual-parent households) have rising connectivity rates. One promising sign of change is that the gap between races for PC ownership has narrowed significantly at the highest income level (above $75,000).

1. Expanding Access to Electronic Services

Americans of every demographic group and geographic area have experienced a significant increase in computer ownership and Internet access. Nationwide, PC ownership is now at 42.1%, up from 24.1% in 1994 and 36.6% in 1997 (an increase of 74.7% and 15.0%, respectively). (Chart I-1) Households across rural, central city, and urban areas now own home computers in greater numbers; each area experienced at least a sixteen percentage point increase since 1994, and at least a five percentage point increase since 1997. (Chart I-11) Similarly, households of all ethnic groups, income levels, education levels, and ages have experienced a significant increase. Black and Hispanic households, for example, are now twice as likely to own PCs as they were in 1994. (Chart I-13)

Internet access has also grown significantly in the last year: 26.2% of U.S. households now have Internet access, up from 18.6% in 1997 (an increase of 40.9%). (Chart I-1)* As with computer ownership, Internet access has increased for all demographic groups in all locations. In the last year alone, for example, Internet access increased 40.5% for White households, 45.4% for Black households, and 44.8% for Hispanic households. (Chart I-23)

2. Disparities In Access to Electronic Services

Despite these gains across American households, distinct disparities in access remain. Americans living in rural areas are less likely to be connected by PCs or the Internet — even when holding income constant. (Charts I-12, I-21) Indeed, at most income brackets below $35,000, those living in urban areas are at least 25% more likely to have Internet access than those in rural areas. (Chart I-21) Additionally, groups that already have low penetration rates (such as low-income, young, or certain minority households) are the least connected in rural areas and central cities.

The following demographic and geographic breakdowns are significant determinants of a household's likelihood of owning a computer or accessing the Internet from home:

Income. PC and Internet penetration rates both increase with higher income levels.** Households at

*Because we have data on Internet access only for 1997 and 1998, a comparison before 1997 is not possible. As explained in the Trendline Study, household Internet access was not measured until 1997. Prior to 1997, the Census Bureau measured which households had "modems" in place. While modems provide a means to access the Internet, they do not necessarily mean that a household actually has Internet access. This measurement therefore does not provide an exact proxy for Internet access.

**PC-penetration and Internet access are closely correlated to income for all but the lowest income level (households earning under $5,000). This income level shows slightly higher rates than the next income level ($5,000-$9,999), which may be explained by the high number of students included in the lowest income category.

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higher income levels are far more likely to own computers and access the Internet than those at the lowest income levels. Those with an income over $75,000 are more than *five times* as likely to have a computer at home (Chart I-12) and are more than *seven times* as likely to have home Internet access (Chart I-21) as those with an income under $10,000.

Low income households in rural areas are the least connected, experiencing connectivity rates in the single digits for both PCs and Internet access. (Charts I-12, I-21) The contrast between low income households (earning between $5,000 and $9,999) in rural America and high income households (earning more than $75,000) in urban areas is particularly acute: 8.1% versus 76.5% for computer ownership (Chart I-12), and 2.9% versus 62.0% for Internet access. (Chart I-21)

The impact of income on Internet access is evident even among families with the same race and family structure. Among similarly-situated families (two parents, same race), a family earning more than $35,000 is two to almost six times as likely to have Internet access as a family earning less than $35,000. (Chart I-29) The most significant disparity is among Hispanic families: two-parent households earning more than $35,000 are nearly *six times* as likely to have Internet access as those earning less than $35,000. *Id.*

Race/Origin. As with telephone penetration, race also influences connectivity. Unlike telephone penetration, however, households of Asian/Pacific Island descent have the clear lead in computer penetration (55.0%) and Internet access rates (36.0%), followed by White households (46.6% and 29.8%, respectively). (Charts I-13, I-22) Black and Hispanic households have far lower PC penetration levels (at 23.2% and 25.5%), and Internet access levels (11.2% and 12.6%). *Id.*

Again, geography and income influence these trends. Urban Asians/Pacific Islanders have the highest computer penetration rates (55.6%) and Internet access rates (36.5%). (Charts I-13, I-22) By contrast, rural Black households are the least connected group in terms of PC ownership (17.9%) or Internet access (7.1%). Id. Black households earning less than $15,000 are also at the opposite end of the spectrum from high income Asians/Pacific Islanders for PC ownership (6.6% versus 85.0%). (Charts I-14, I-24)

The role of race or ethnic origin is highlighted when looking at similarly-situated families. A White, two-parent household earning less than $35,000 is nearly *three times* as likely to have Internet access as a comparable Black household and nearly *four times* as likely to have Internet access as Hispanic households in the same income category.[9]

Education. Access to information resources is closely tied to one's level of education. Households at higher education levels are far more likely to own computers and access the Internet than those at the lowest education levels. Those with a college degree or higher are more than *eight times* as likely to have a computer at home (68.7% versus 7.9%) and are nearly *sixteen times* as likely to have home Internet access (48.9% versus 3.1%) as those with an elementary school education. (Charts I-17, I-25) In rural areas, the disparity is even greater. Those with a college degree or higher are more than *eleven times* as likely to have a computer at home (6.3% versus 69.7%) and are more than *twenty-six times* as likely to have home Internet access (1.8% versus 47.0%) as those with an elementary school education. *Id.*

Household Type. As with telephones, the makeup of the household influences the likelihood of the household's access to electronic services. Computer ownership lags among single-parent households, especially female-headed households (31.7%), compared to married couples with children (61.8%).

[9] These calculations are derived from NTIA's own cross-tabulation of the Census data.

(Chart I-18) The same is true for Internet access (15.0% for female-headed households, 39.3% for dual-parent households). (Chart I-26)

When holding race constant, it is clear that family composition can still have a significant impact on Internet access. Overall, dual-parent White families are nearly *twice* as likely to have Internet access as single-parent White households (44.9% versus 23.4%). Black families with two parents are nearly *four times* as likely to have Internet access as single-parent Black households (20.4% versus 5.6%). And, children of two-parent Hispanic homes are nearly *two and a half times* as likely to have Internet access as their single-parent counterparts (14.0% versus 6.0%). [10]

These differences are modified somewhat when income is taken into account. Nevertheless, even when comparing households of similar incomes, disparities in Internet access persist. At all income levels, Black, Asian, and Native American households with two parents, are twice as likely to have Internet access as those with one parent. For Hispanics and White households with two parents, on the other hand, clear-cut differences emerge only for incomes above $35,000. For these households, Whites are one and a half times more likely and Hispanics are *twice* as likely to have Internet access.[11]

Age. Age also plays a role in access to information resources. While seniors have the highest penetration rates for telephones, they trail all other age groups with respect to computer ownership (25.8%) and Internet access (14.6%). (Charts I-19, I-27) Young households (under age 25) exhibit the second lowest penetration rates (32.3% for PCs, 20.5% for Internet access). *Id.* Households in the middle-age brackets (35-55 years) lead all others in PC penetration (nearly 55.0%) and Internet access (over 34.0%). *Id.* The contrasts among age groups are particularly striking between rural seniors (23.3% for PCs, 12.4% for Internet) and young, rural households (27.7% for PCs, 13.3% for Internet) on the one hand, and urban 45-54 year-olds on the other (55.3% for PCs, 36.5% for Internet). *Id.*

Region. The region where a household is located also impacts its access to electronic services. The West is the clear-cut leader for both computer penetration (48.9%) and Internet access (31.3%). (Charts I-20, I-28) At the other end of the spectrum is the South at 38.0% for PC penetration and 23.5% for Internet access. *Id.* Looking at the degree of urbanization, the lowest rates are in Northeast central cities (30.4% for PCs, 18.7% for Internet access); the highest are in the urban West (49.2% for PCs, 32.0% for Internet access). *Id.*

State. As with telephones, computer penetration among states is grouped according to tiers due to the ranges of certainty created by the use of 90% confidence intervals (Table I-2)[12] The top tier ranges from Alaska's 62.4% to Wyoming's 46.1%. The middle grouping is bounded by Arizona (44.3%) and Pennsylvania (39.3%). The low tier includes principally southern states, ranging from Oklahoma (37.8%) to Mississippi (25.7%). Id. Regarding Internet access, the ordering of the states — ranging from Alaska (44.1%) to Mississippi (13.6%) — tracks relatively closely the PC rankings, but often with wider confidence intervals at the 90% level. (Table I-3)

In sum, disparities with respect to electronic access clearly exist across various demographic and geographic categories. Similar to telephone penetration, electronic access comes hardest for Americans who are low-income, Black or Hispanic or Native American,[13] less educated, single-parent

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[10] Id.

[11] Id.

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[12] See supra note 6 regarding confidence intervals used for telephone penetration.

[13] This report uses "Native Americans" as a shorthand reference to American Indians, Eskimos, and Aleuts.

families (but especially single-female householders), young heads-of-households, and who live in the South, rural areas or central cities. Dissimilar to the phone profile, however, senior "have nots" are less connected in terms of electronic access. And Asians/Pacific Islanders have reached a leading status with respect to computers and Internet access that they have not enjoyed in telephone comparisons.

3. Expanding Digital Divide

The chief concern with respect to household computer and Internet access is the growing digital divide. Groups that were already connected (*e.g.*, higher-income, more educated, White and Asian/Pacific Islander households) are now far more connected, while those with lower rates have increased less quickly. As a result, the gap between the information "haves" and "have nots" is growing over time. The increasing divides are particularly troublesome with regard to Internet access.

a. Divide by Race/Origin

The digital divide has turned into a "racial ravine" when one looks at access among households of different races and ethnic origins. With regard to computers, the gap between White and Black households *grew* 39.2% (from a 16.8 percentage point difference to a 23.4 percentage point difference) between 1994 and 1998. For White versus Hispanic households, the gap similarly *rose by 42.6%* (from a 14.8 point gap to 21.1 point gap). (Chart I-15)

Minorities are losing ground even faster with regard to Internet access. Between 1997 and 1998, the gap between White and Black households *increased by 37.7%* (from a 13.5 percentage point difference to a 18.6 percentage point difference), and *by 37.6%* (from a 12.5 percentage point difference to a 17.2 percentage point difference) between White and Hispanic households. (Chart I-23)

Even when holding income constant, there is still a yawning divide among different races and origins. At the lowest income levels, the gap has widened considerably for computer ownership.[14] For households earning less than $15,000, the gaps rose substantially: by 73.0% or an additional 4.6 points between White and Black households, and by 44.6% or an additional 2.5 points between White and Hispanic households. (Chart I-16a) For the households earning between $15,000 and $34,999, the disparities between White and Black households has increased by 61.7% (or 5.0 percentage points), and 46.0% or (4.0 percentage points) between White and Hispanic households. (Chart I-16b)

For the same period, the increases for the $35,000-$74,999 bracket are much smaller for both the White/Black gap (a growth of 6.4%, or 1.0 percentage points) and the White/Hispanic divide (a growth of 15.2%, or 1.5 percentage points). (Chart I-16c) The most striking finding, however, concerns the highest income level of $75,000 or more. For that income range, the gap between White and Black households has *declined* substantially (by 76.2%, or 6.4 percentage points), while the gap between White and Hispanic households has grown by 4.9 percentage points. (Chart I-16d).

b. Divide Based on Education Level

Households at higher education levels are now also much more likely to own computers and access the Internet than those at the lowest education levels. In the last year alone, the gap in computer use has grown 7.8% (from a 56.4 to a 60.8 percentage point difference). (Table I-4b)

[14] Data for Internet access by race and income was unavailable. This discussion pertains to computer ownership only.

The divide with respect to Internet access has widened 25.0% (from a 36.6 to a 45.8 percentage point difference). (Table I-4d) Not all groups, however, are lagging further behind the front-runners. Those with some college education, and those with a high school diploma, are now closing in on those with a college education. *Id.*

*c. **Divide Based on Income***

The digital divide has widened substantially when comparing households of different incomes. In the last year, the divide between the highest and lowest income groups grew 29.0% (from a 42.0 to a 52.2 percentage point difference) for Internet access. (Table I-4c) The same trends are recurring with respect to all income levels lower than $50,000. Interestingly, however, the gap appears to be narrowing for the mid-range and upper income groups. Households earning between $50,000 - $74,999 are now actually closer (by 0.4 percentage points) to those at the highest income level than they were in 1997. *Id.*

Middle-income households are faring far better with regard to computers. A significant drop of 11.1% (from a 15.3 to a 13.6 percentage point difference) occurred between the highest ($75,000+) and second highest ($50,000 - $74,999) income brackets. (Table I-4a) And the gaps are also narrowing — though less significantly — for those earning more than $25,000.

D. CONCLUSION

The Census data reveal a number of trends. On the positive side, it is apparent that *all* Americans are becoming increasingly connected — whether by telephone, computer, or the Internet — over time. On the other hand, it is also apparent that certain groups are growing far more rapidly, particularly with respect to Internet connectivity. This pattern means that the "haves" have only become more information-rich in 1998, while the "have nots" are lagging even further behind.

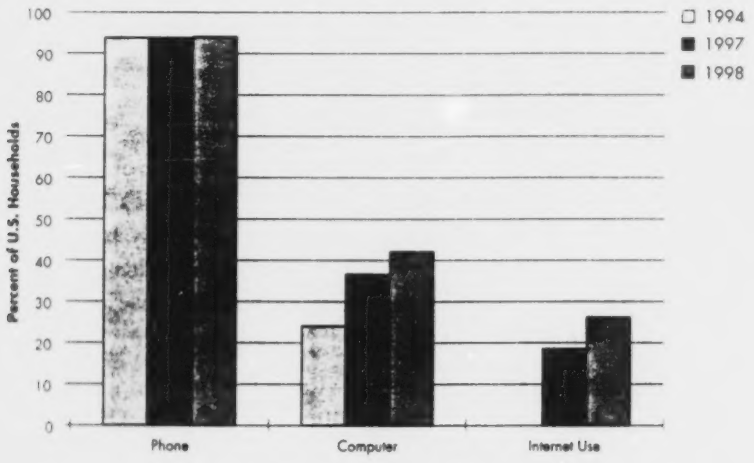
As the Internet becomes a more mature and pervasive technology, the digital divide among households of different races, incomes, and education levels may narrow. This pattern is already occurring with regard to home computers. Race matters less at the highest income level, and the gap is narrowing among households of higher income and education levels.

Even so, it is reasonable to expect that many people are going to lag behind in absolute numbers for a long time. Education and income appear to be among the leading elements driving the digital divide today. Because these factors vary along racial and ethnic lines, minorities will continue to face a greater digital divide as we move into the next century. This reality merits a thoughtful response by policymakers consistent with the needs of Americans in the Information Age.

Chart I-1:

Percent of U.S. Households with a Telephone, Computer, and Internet Use

1994, 1997, 1998



	Phone	Computer	Internet Use
1994	93.8	24.1	-
1997	93.8	36.6	18.6
1998	94.1	42.1	26.2

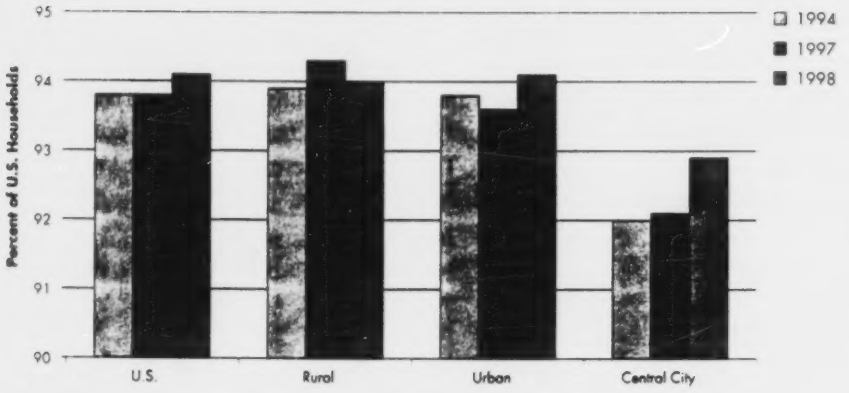
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, October 1997,and December 1998 Current Population Surveys.

Chart I-2:

Percent of U.S. Households with a Telephone

By Rural, Urban, and Central City Areas

1994, 1997, 1998



	U.S.	Rural	Urban	Central City
1994	93.8	93.9	93.8	92.0
1997	93.8	94.3	93.6	92.1
1998	94.1	94.0	94.1	92.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, October 1997 and December 1998 Current Population Surveys.

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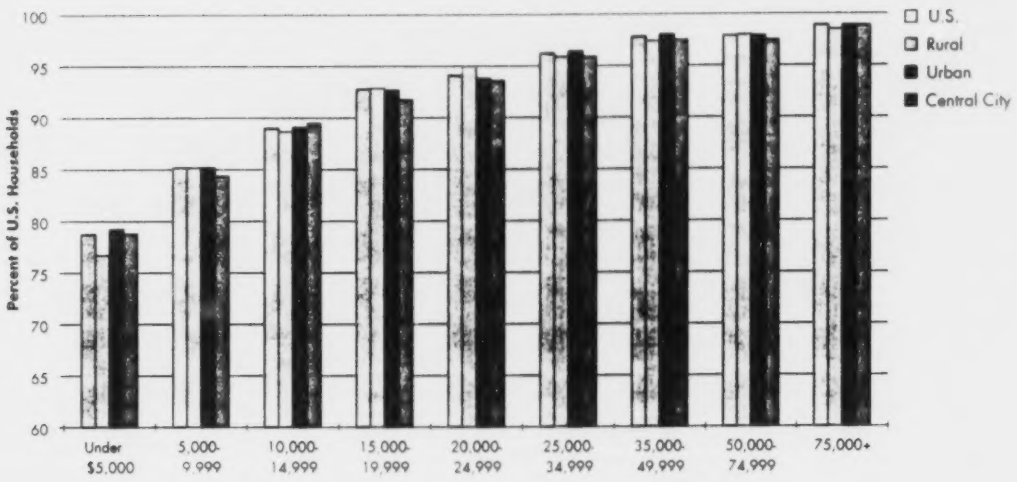
Chart I-3:

Percent of U.S. Households with a Telephone

By Income
By Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
Under $5,000	78.7	76.7	79.2	78.8
5,000-9,999	85.2	85.2	85.2	84.4
10,000-14,999	89.0	88.7	89.1	89.5
15,000-19,999	92.8	92.9	92.7	91.8
20,000-24,999	94.1	95.0	93.8	93.6
25,000-34,999	96.2	95.9	96.4	95.9
35,000-49,999	97.8	97.4	98.0	97.5
50,000-74,999	97.9	98.0	97.9	97.5
75,000+	98.9	98.5	98.9	98.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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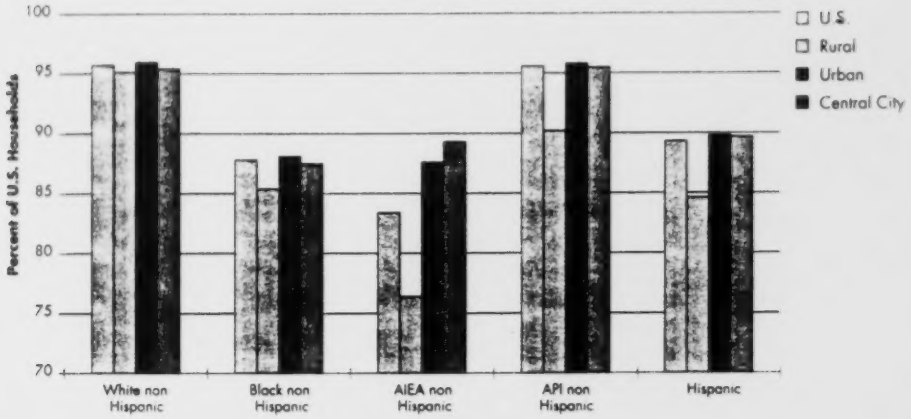
Chart I-4:

Percent of U.S. Households with a Telephone

By Race/Origin
By Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
White non Hispanic	95.7	95.1	95.9	95.4
Black non Hispanic	87.8	85.4	88.1	87.5
AIEA non Hispanic	83.4	76.4	87.6	89.3
API non Hispanic	95.6	90.2	95.8	95.5
Hispanic	89.3	84.6	89.8	89.7

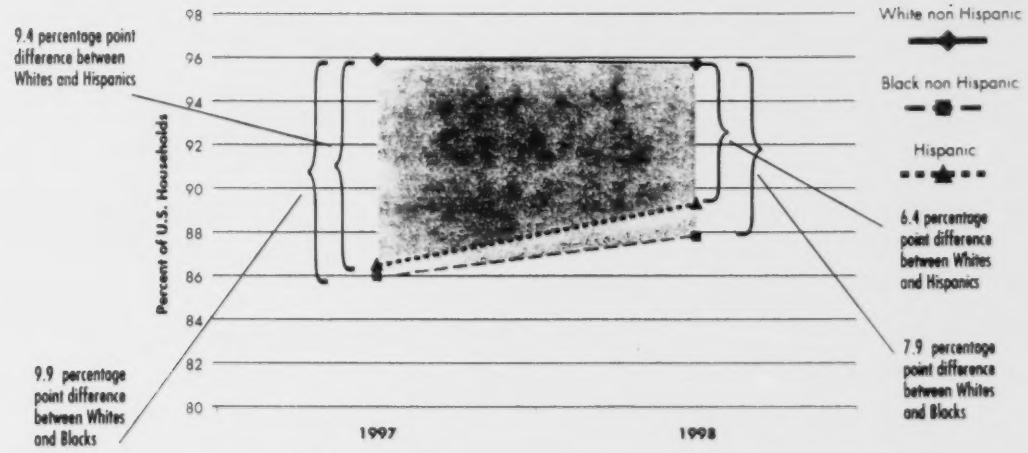
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-5:

U.S. Household Telephone Penetration Gap

By Race/Origin

1997 vs. 1998



	White non Hispanic	Black non Hispanic	Hispanic
1997	95.9	86.0	86.5
1998	95.7	87.8	89.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using October 1997 and December 1998 Current Population Surveys.

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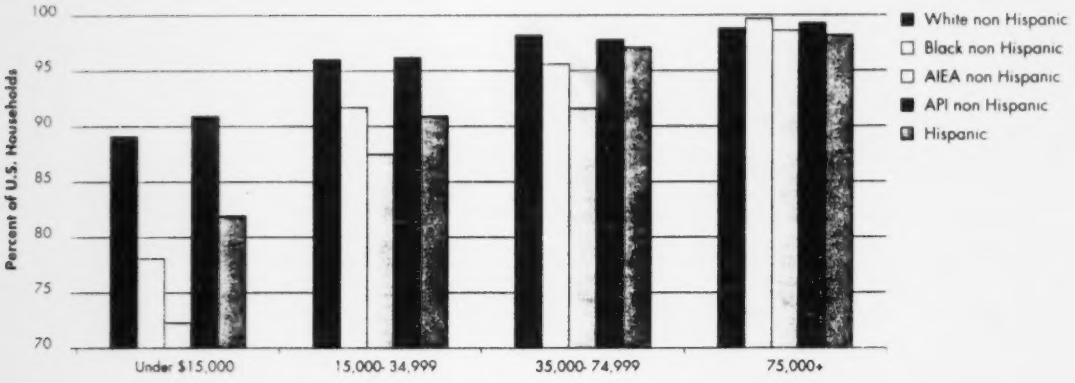
Chart I-6:

Percent of U.S. Households with a Telephone

By Income
By Race/Origin

1998



	Under $15,000	15,000- 34,999	35,000- 74,999	75,000+
White non Hispanic	89.1	96.0	98.2	98.8
Black non Hispanic	78.1	91.7	95.6	99.7
AIEA non Hispanic	72.3	87.5	91.6	98.6
API non Hispanic	90.9	96.2	97.8	99.3
Hispanic	81.9	90.9	97.1	98.2

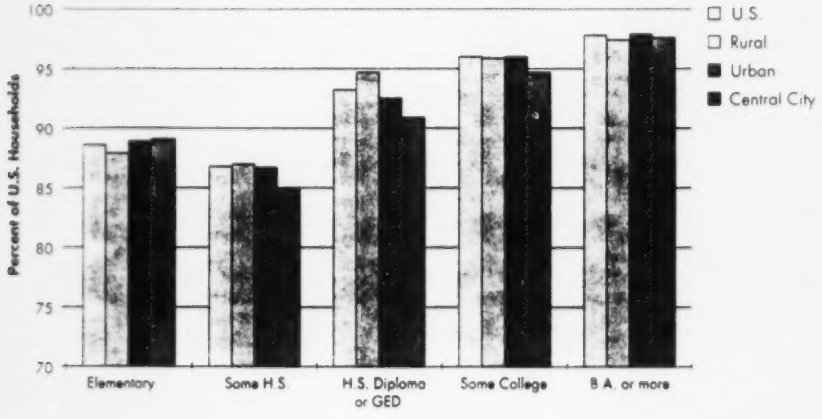
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-7:

Percent of U.S. Households with a Telephone

By Education
By Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Elementary	88.6	87.9	88.9	89.1
Some H.S.	86.8	87.0	86.7	85.0
H.S. Diploma or GED	93.2	94.7	92.5	90.9
Some College	96.0	95.9	96.0	94.7
B.A. or more	97.8	97.4	97.9	97.6

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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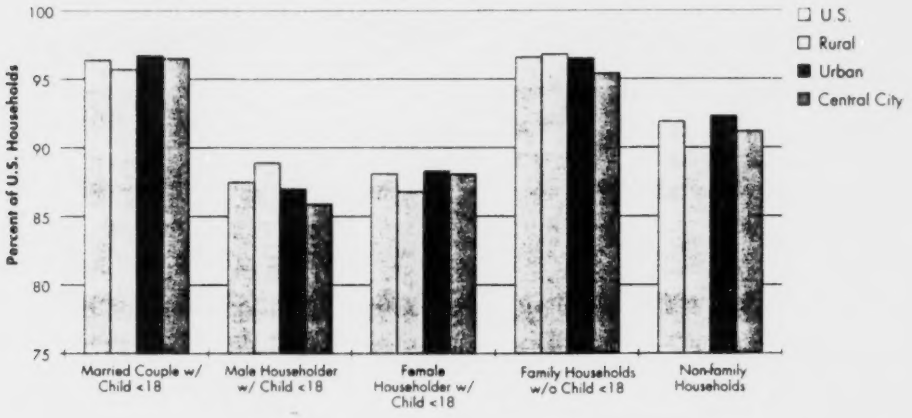
Chart I-8:

Percent of U.S. Households with a Telephone

By Household Type
By Rural, Urban, and Central City Areas
1998



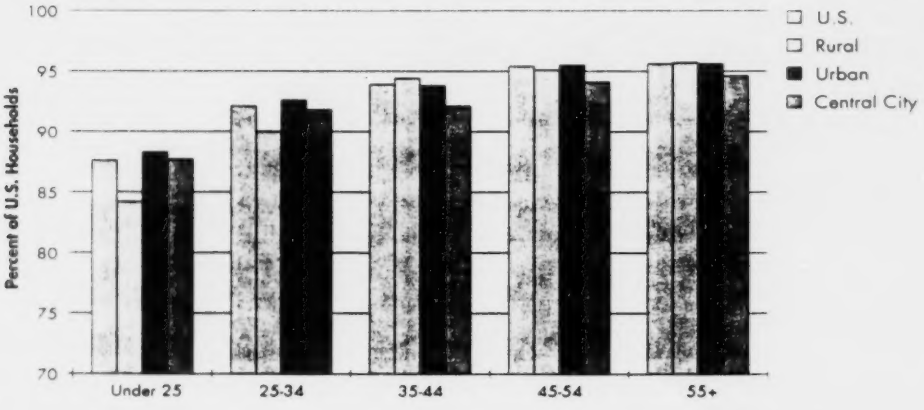
	U.S.	Rural	Urban	Central City
Married Couple w/ Child <18	96.4	95.7	96.7	96.5
Male Householder w/ Child <18	87.5	88.9	87.0	85.9
Female Householder w/ Child <18	88.1	86.8	88.3	88.1
Family Households w/o Child	96.6	96.8	96.5	95.4
Non-family Households	91.9	90.0	92.3	91.2

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-9:

Percent of U.S. Households with a Telephone

By Age
By Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
Under 25 years	87.6	84.2	88.3	87.7
25-34 years	92.1	90.0	92.6	91.8
35-44 years	93.9	94.4	93.8	92.1
45-54 years	95.4	95.1	95.5	94.1
55+ years	95.6	95.7	95.6	94.6

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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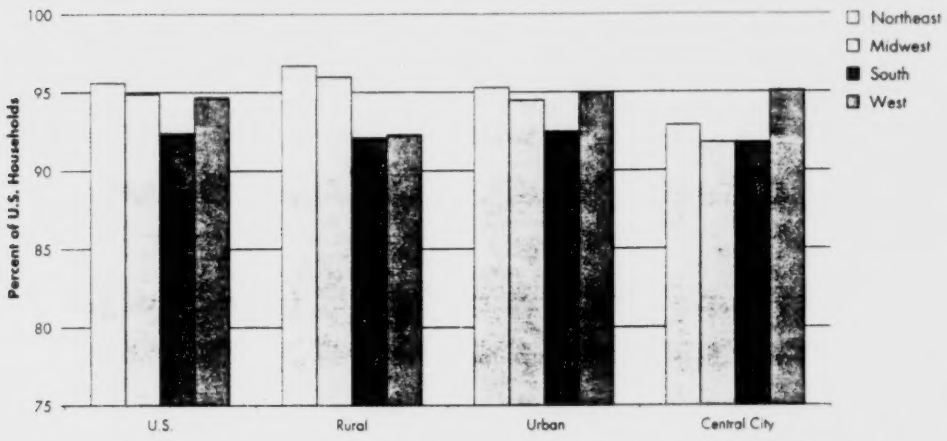
Chart I-10:

Percent of U.S. Households with a Telephone

By Region
By Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
Northeast	95.6	96.7	95.3	92.9
Midwest	94.9	96.0	94.5	91.8
South	92.4	92.1	92.5	91.8
West	94.7	92.3	95.0	95.1

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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Table I-1: **Percent of Households with Telephones, by States: 1998**

(Numbers in thousands.)

State	Total Households Surveyed	Percent with Telephones	90% Confidence Interval	
Minnesota	1,865	98.0	0.82*	HIGH
North Dakota	245	97.5	0.95*	
Maryland	2,101	97.2	1.01*	
Pennsylvania	4,589	96.7	0.61	
Delaware	291	96.6	1.18*	
Maine	517	96.5	1.14	
Wisconsin	2,040	96.4	1.07	
Missouri	2,199	96.2	1.13	
Oregon	1,307	96.0	1.18	
Iowa	1,162	96.0	1.15	
Ohio	4,481	95.8	0.71	MIDDLE
Nebraska	652	95.8	1.2	
Alaska	215	95.7	1.27	
New Hampshire	451	95.6	1.41	
Washington	2,227	95.5	1.27	
Massachusetts	2,398	95.5	0.90	
Colorado	1,550	95.4	1.21	
New York	6,974	95.1	0.57	
Connecticut	1,252	95.1	1.44	
California	11,782	95.1	0.53	
New Jersey	2,933	95.1	0.85	
Michigan	3,793	94.9	0.81	
Vermont	240	94.8	1.44	
Montana	351	94.7	1.27	
Rhode Island	375	94.6	1.51	
Utah	674	94.6	1.35	
Kansas	1,052	94.5	1.33	
Idaho	446	94.1	1.35	
Wyoming	180	94.0	1.45	
Indiana	2,338	93.9	1.37	
Alabama	1,688	93.6	1.41	
North Carolina	2,928	93.6	1.04	
West Virginia	750	93.5	1.32	
Tennessee	2,221	93.4	1.45	
Hawaii	393	93.2	1.80	
Nevada	665	93.1	1.54	
Arizona	1,732	92.9	1.43	
Kentucky	1,591	92.9	1.46	
South Carolina	1,488	92.6	1.61	
Virginia	2,629	92.3	1.49	
Florida	6,012	92.3	0.80	
Illinois	4,507	91.8	0.96	LOW
Texas	7,302	91.6	0.84	
Georgia	2,926	91.4	1.45	
Louisiana	1,586	91.1	1.64	
Washington, DC	235	91.0	1.76	
South Dakota	280	91.0	1.67	
Mississippi	1,078	90.3	1.71	
Oklahoma	1,297	89.6	1.69$	
Arkansas	1,026	88.7	1.80$	
New Mexico	649	87.1	1.97$	

* = Indicates estimate not significantly different from highest state estimate.
$ = Indicates estimate not significantly different from lowest state estimate.

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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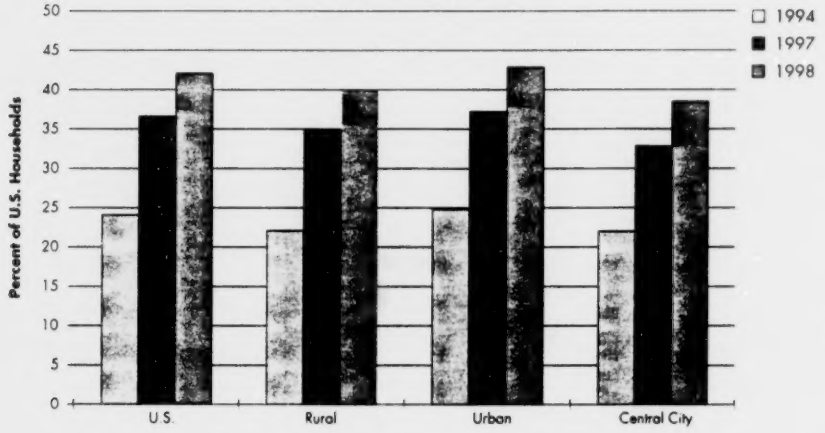
Chart I-11:

Percent of U.S. Households with a Computer

By U.S., Rural, Urban, and Central City Areas

1994, 1997, 1998



	U.S.	Rural	Urban	Central City
1994	24.1	22.1	24.8	22.0
1997	36.6	34.9	37.2	32.8
1998	42.1	39.9	42.9	38.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, October 1997, and December 1998 Current Population Surveys.

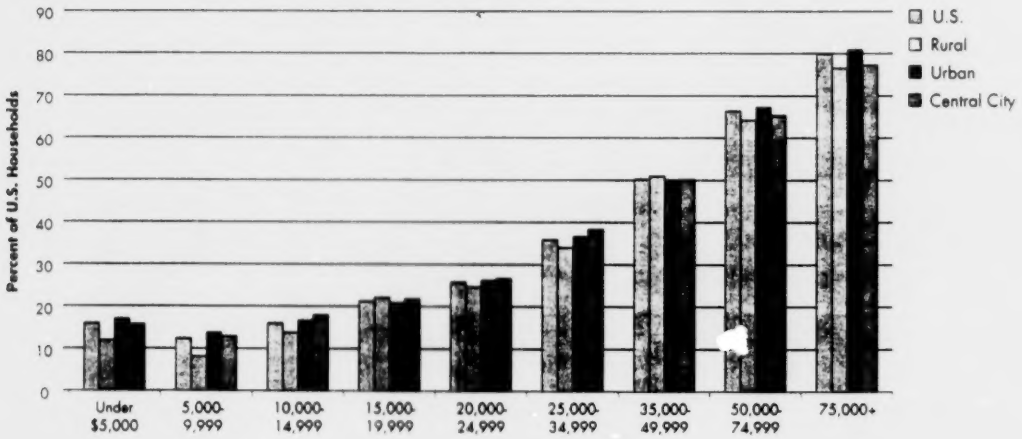
Chart I-12:

Percent of U.S. Households with a Computer

By Income

By Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Under $5,000	15.9	11.9	16.9	15.7
5,000-9,999	12.3	8.1	13.6	12.9
10,000-14,999	15.9	13.8	16.6	17.9
15,000-19,999	21.2	22.1	20.8	21.8
20,000-24,999	25.7	24.7	26.1	26.6
25,000-34,999	35.8	34.0	36.5	38.3
35,000-49,999	50.2	51.0	50.0	50.2
50,000-74,999	66.3	64.2	67.1	65.4
75,000+	79.9	76.5	80.8	77.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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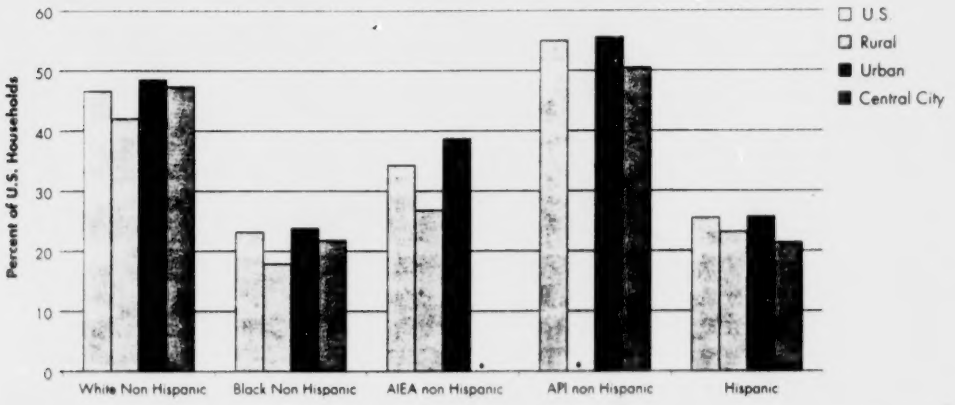
Chart I-13:

Percent of U.S. Households with a Computer

By Race/Origin
By US., Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
White Non Hispanic	46.6	42.0	48.5	47.4
Black Non Hispanic	23.2	17.9	23.8	21.8
AIEA non Hispanic	34.3	26.8	38.7	35.6*
API non Hispanic	55.0	40.6*	55.6	50.5
Hispanic	25.5	23.2	25.7	21.4

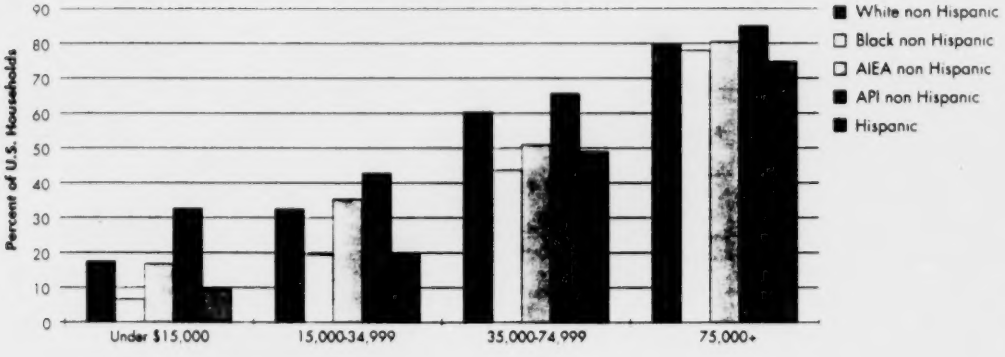
*Statistically not significant

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-14:

Percent of U.S. Households with a Computer

By Income
By Race/Origin
1998



	Under $15,000	15,000-34,999	35,000-74,999	75,000+
White non Hispanic	17.5	32.5	60.4	80.0
Black non Hispanic	6.6	19.4	43.7	78.0
AIEA non Hispanic	16.8	35.3	50.9	80.5
API non Hispanic	32.6	42.7	65.6	85.0
Hispanic	9.4	19.8	49.0	74.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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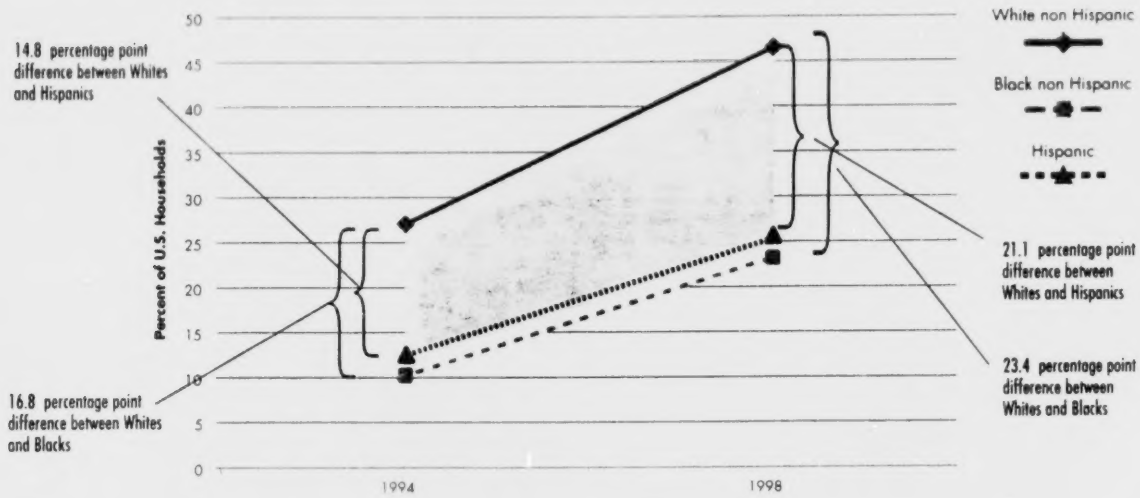
Chart I-15:

U.S. Household Computer Penetration Gap

By Race/Origin

1994 vs. 1998



	White non Hispanic	Black non Hispanic	Hispanic
1994	27.1	10.3	12.3
1998	46.6	23.2	25.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994 and December 1998 Current Population Surveys.

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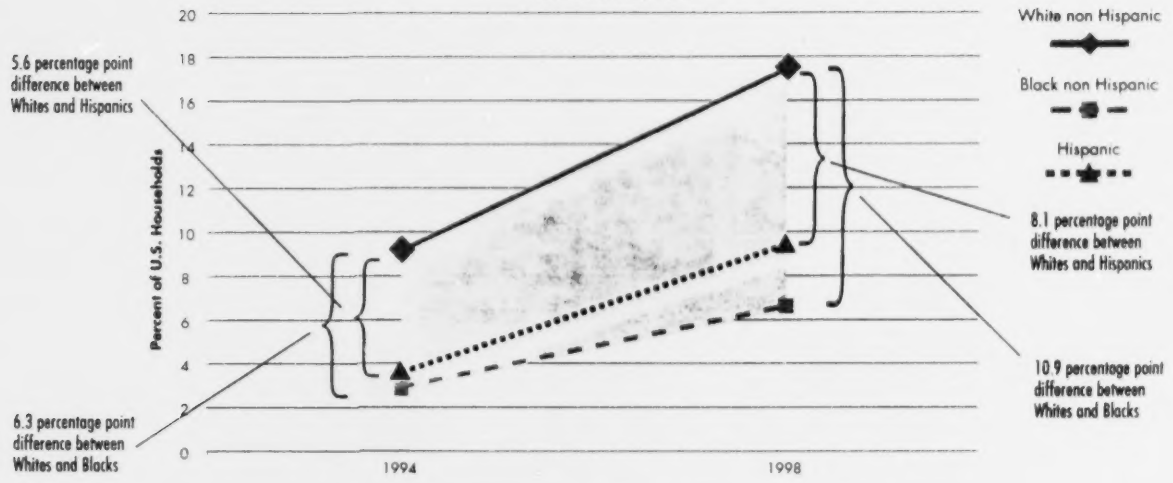
Chart I-16(a):

U.S. Household Computer Penetration Gap

By Income
By Race/Origin
1994 vs. 1998

Under $15,000



	White non Hispanic	Black non Hispanic	Hispanic
1994	9.2	2.9	3.6
1998	17.5	6.6	9.4

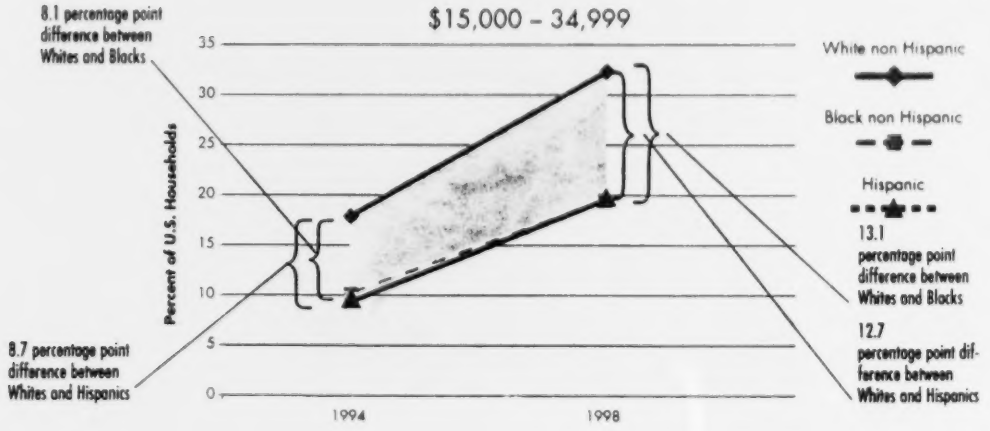
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994 and December 1998 Current Population Surveys.

Chart I-16(b):

U.S. Household Computer Penetration Gap

By Income
By Race/Origin
1994 vs. 1998

$15,000 – 34,999



	White non Hispanic	Black non Hispanic	Hispanic
1994	18.1	10.0	9.4
1998	32.5	19.4	19.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994 and December 1998 Current Population Surveys.

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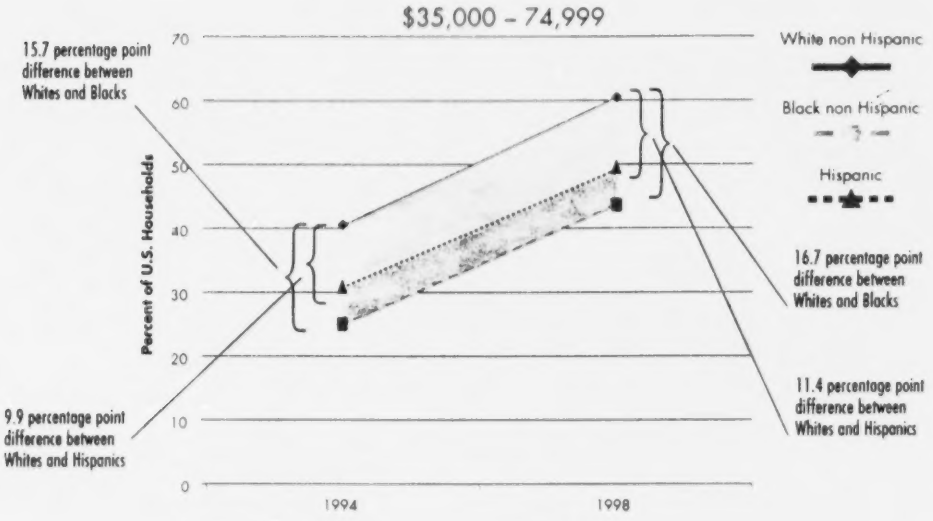
Chart I-16(c):

U.S. Household Computer Penetration Gap

By Income
By Race/Origin
1994 vs. 1998



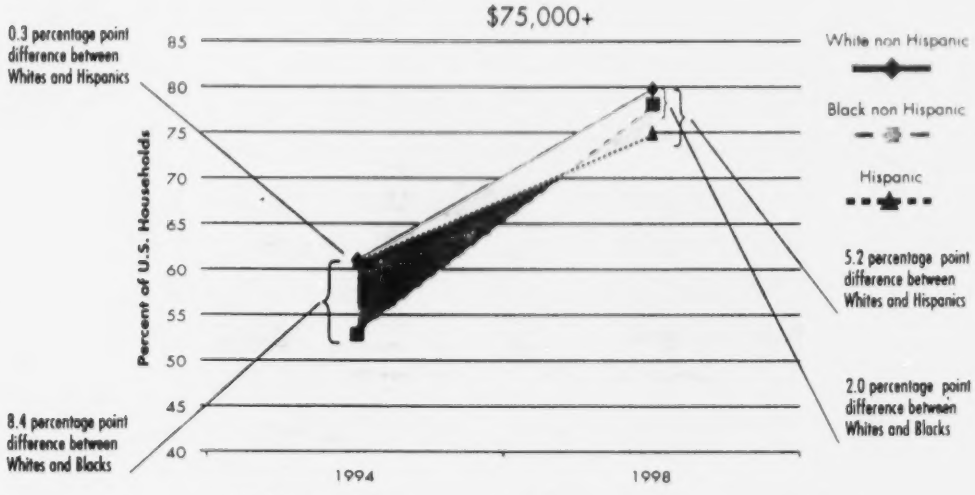
	White non Hispanic	Black non Hispanic	Hispanic
1994	40.5	24.8	30.6
1998	60.4	43.7	49.0

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994 and December 1998 Current Population Surveys.

Chart I-16(d):

U.S. Household Computer Penetration Gap

By Income
By Race/Origin
1994 vs. 1998



	White non Hispanic	Black non Hispanic	Hispanic
1994	61.0	52.6	60.7
1998	80.0	78.0	74.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994 and December 1998 Current Population Surveys.

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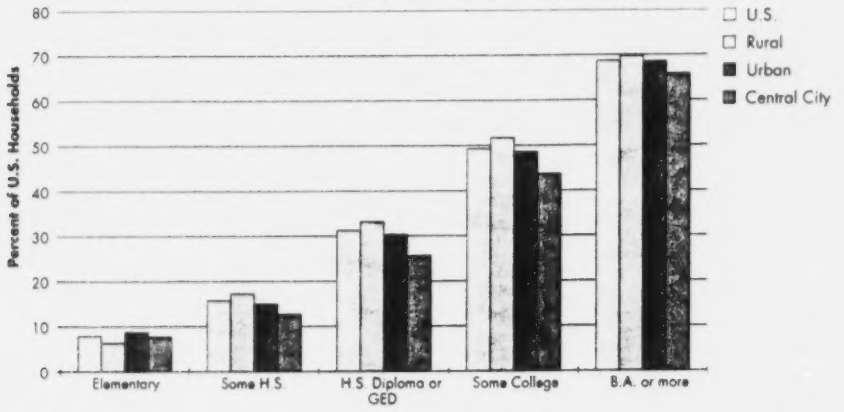
Chart I-17:

Percent of U.S. Households with a Computer

By Education

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Elementary	7.9	6.3	8.7	7.7
Some H.S.	15.7	17.2	15.0	12.7
H.S. Diploma or GED	31.2	33.2	30.3	25.6
Some College	49.3	51.7	48.6	43.7
B.A. or more	68.7	69.7	68.5	65.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

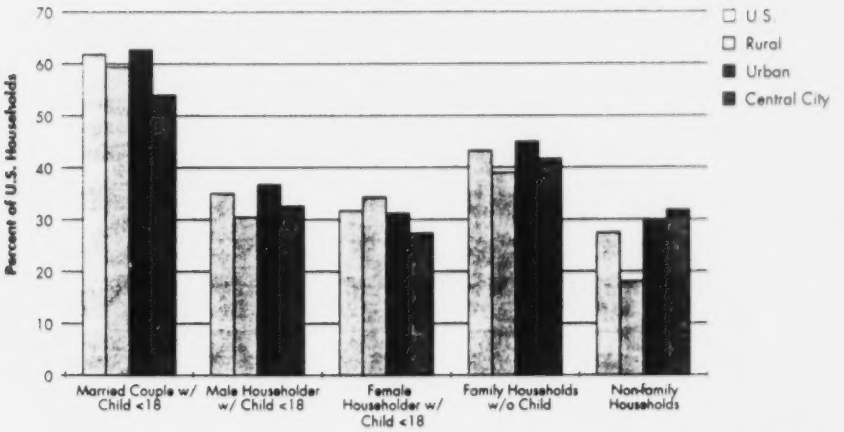
Chart I-18:

Percent of U.S. Households with a Computer

By Household Type

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Married Couple w/ Child <18	61.8	59.4	62.7	54.0
Male Householder w/ Child <18	35.0	30.5	36.7	32.6
Female Householder w/ Child <18	31.7	34.3	31.2	27.4
Family Households w/o Child	43.2	39.0	45.0	41.7
Non-family Households	27.5	18.1	29.7	31.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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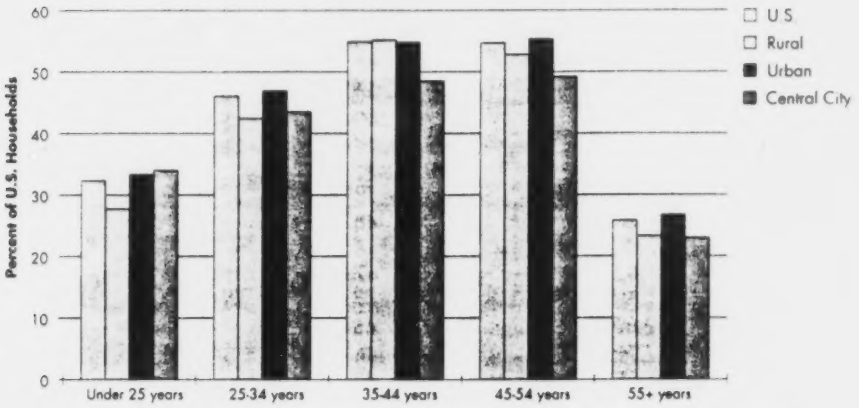
Chart I-19:

Percent of U.S. Households with a Computer

By Age

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Under 25 years	32.3	27.7	33.3	34.0
25-34 years	46.0	42.4	46.9	43.5
35-44 years	54.9	55.2	54.8	48.5
45-54 years	54.7	52.8	55.3	49.2
55+ years	25.8	23.3	26.7	23.0

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

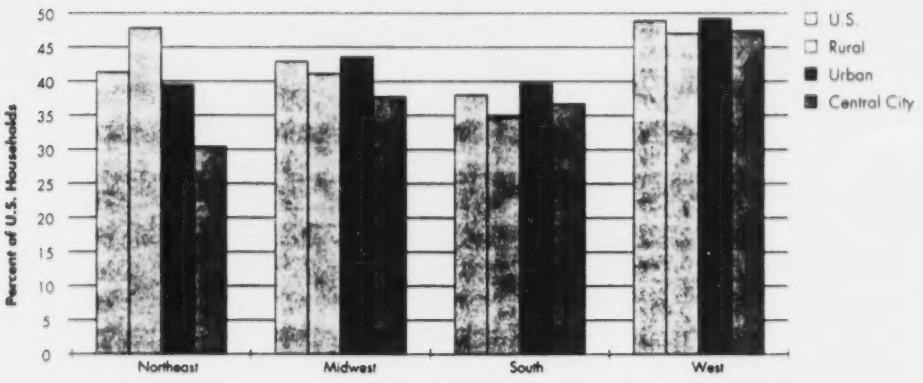
Chart I-20:

Percent of U.S. Households with a Computer

By Region

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Northeast	41.3	47.8	39.5	30.4
Midwest	42.9	41.1	43.6	37.7
South	38.0	34.6	39.6	36.7
West	48.9	47.0	49.2	47.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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Table I-2: **Percent of Households with Computers, by States: 1998**

(Numbers in thousands.)

State	Total Households Surveyed	Percent with Computers	90% Confidence Interval	
Alaska	215	62.4	3.03*	HIGH
Utah	674	60.1	2.93*	
Washington	2,227	56.3	3.03	
Colorado	1,550	55.3	2.88	
New Hampshire	451	54.2	3.42	
Oregon	1,307	51.3	3.03	
Idaho	446	50.0	2.86	
Vermont	240	48.7	3.24	
New Jersey	2,933	48.1	1.98	
Minnesota	1,865	47.6	2.88	
California	11,782	47.5	1.23	
Virginia	2,629	46.4	2.79	
Maryland	2,101	46.3	3.02	
Wyoming	180	46.1	3.04	
Arizona	1,732	44.3	2.77	MIDDLE
Michigan	3,793	44.0	1.83	
Connecticut	1,252	43.8	3.32	
Kansas	1,052	43.7	2.89	
Indiana	2,338	43.5	2.84	
Maine	517	43.4	3.09	
Massachusetts	2,398	43.4	2.15	
Wisconsin	2,040	43.0	2.83	
Nebraska	652	42.9	2.97	
Illinois	4,507	42.7	1.73	
Hawaii	393	42.3	3.54	
New Mexico	649	42.2	2.90	
Missouri	2,199	41.8	2.91	
Nevada	665	41.6	3.00	
South Dakota	280	41.6	2.87	
Iowa	1,162	41.4	2.88	
Washington, DC	235	41.4	3.04	
Rhode Island	375	41.0	3.29	
Montana	351	40.9	2.78	
Texas	7,302	40.9	1.50	
Ohio	4,481	40.7	1.75	
Delaware	291	40.5	3.19	
North Dakota	245	40.2	2.97	
Florida	6,012	39.5	1.47	
Pennsylvania	4,589	39.3	1.66	
Oklahoma	1,297	37.8	2.68	LOW
Tennessee	2,221	37.5	2.81	
New York	6,974	37.3	1.29	
Kentucky	1,591	35.9	2.73	
Georgia	2,926	35.8	2.48	
South Carolina	1,488	35.7	2.95	
North Carolina	2,928	35.0	2.02	
Alabama	1,688	34.3	2.75	
Louisiana	1,586	31.1	2.67	
Arkansas	1,026	29.8	2.59	
West Virginia	750	28.3	2.40$	
Mississippi	1,078	25.7	2.52$	

* = Indicates estimate not significantly different from highest state estimate.

$ = Indicates estimate not significantly different from lowest state estimate.

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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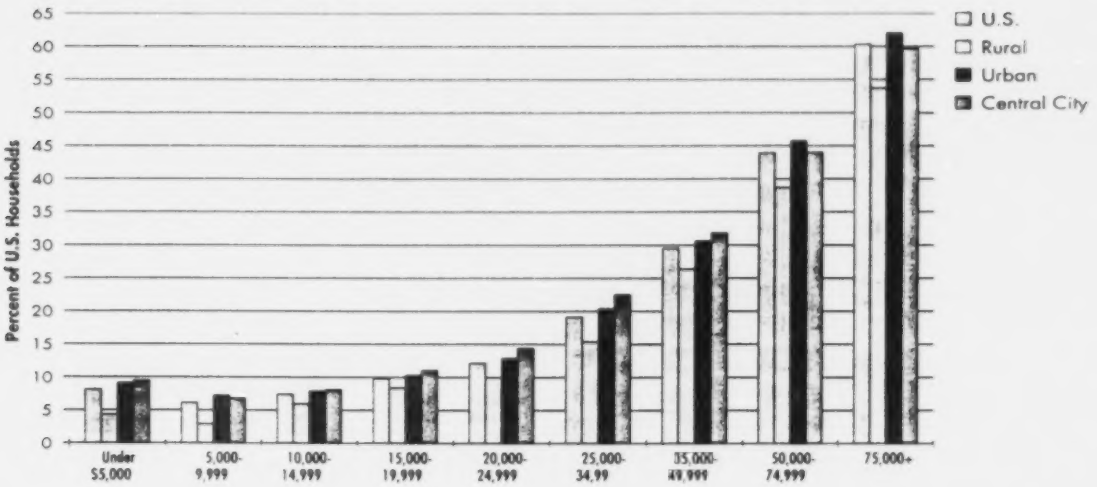
Chart I-21:

Percent of U.S. Households Using the Internet

By Income

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Under $5,000	8.1	4.3	9.1	9.5
5,000-9,999	6.1	2.9	7.2	6.8
10,000-14,999	7.4	6.0	7.9	8.1
15,000-19,999	9.8	8.4	10.3	11.0
20,000-24,999	12.1	10.0	12.9	14.4
25,000-34,999	19.1	15.4	20.4	22.5
35,000-49,999	29.5	26.4	30.6	31.8
50,000-74,999	43.9	38.7	45.7	44.0
75,000+	60.3	53.7	62.0	59.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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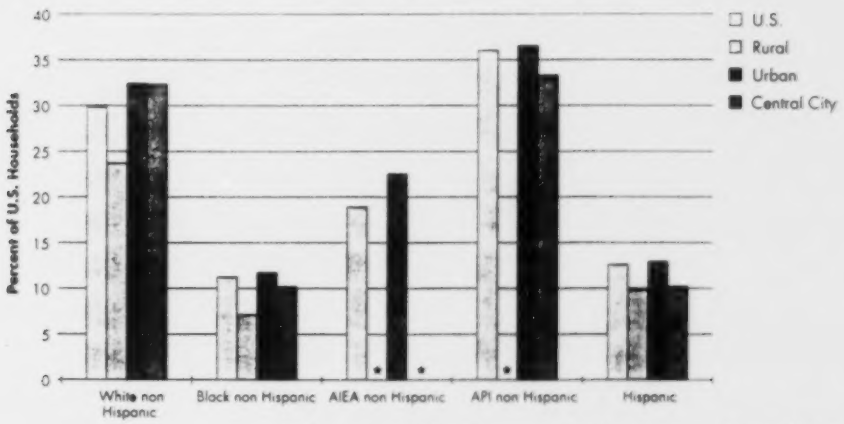
Chart I-22:

Percent of U.S. Households Using the Internet

By Race/Origin

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
White non Hispanic	29.8	23.7	32.4	32.3
Black non Hispanic	11.2	7.1	11.7	10.2
AIEA non Hispanic	18.9	12.8*	22.5	20.2*
API non Hispanic	36.0	24.7*	36.5	33.3
Hispanic	12.6	9.8	12.9	10.2

* Statistically not significant

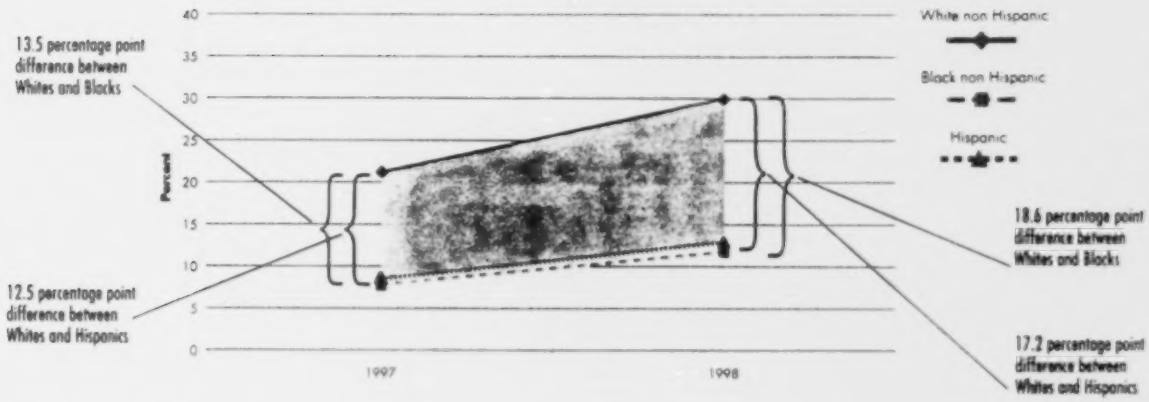
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-23:

Percent of U.S. Households Using the Internet

By Race/Origin

1997-1998



	1997	1998
White non Hispanic	21.2	29.8
Black non Hispanic	7.7	11.2
Hispanic	8.7	12.6

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using October 1997 and December 1998 Current Population Surveys.

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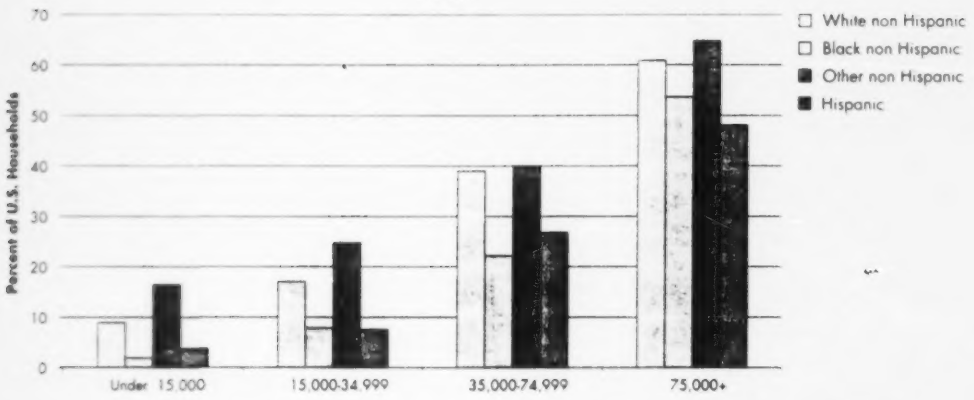
Chart I-24:

Percent of U.S. Households Using the Internet

By Race/Origin
By Income
1998



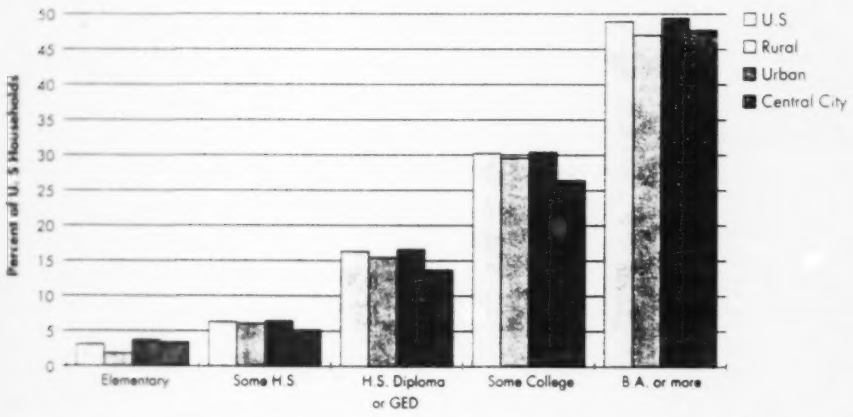
	Under $15,000	15,000-34,999	35,000-74,999	75,000+
White non Hispanic	8.9	17.0	39.0	60.9
Black non Hispanic	1.9	7.9	22.2	53.7
Other non Hispanic	16.4	24.7	39.9	64.8
Hispanic	3.8	7.6	26.8	48.1

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-25:

Percent of U.S. Households Using the Internet

By Education
By U.S., Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
Elementary	3.1	1.8	3.7	3.4
Some H.S.	6.3	6.1	6.4	5.2
H.S. Diploma or GED	16.3	15.5	16.6	13.7
Some College	30.2	29.6	30.4	26.4
B.A. or more	48.9	47.0	49.4	47.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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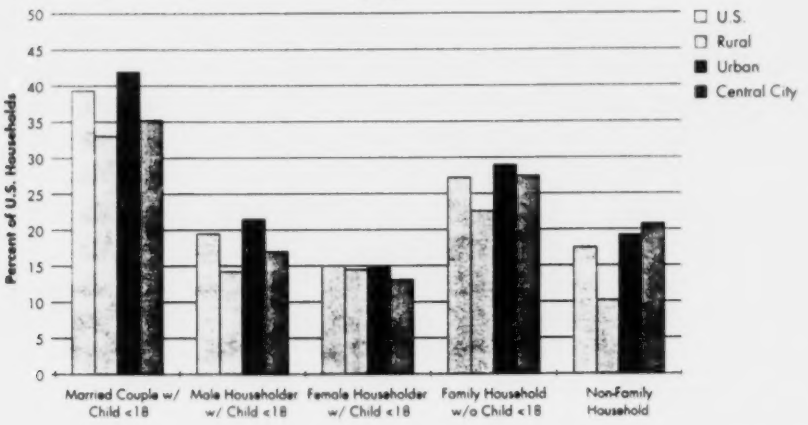
Chart I-26:

Percent of U.S. Households Using the Internet

By Household Type

1998



	U.S.	Rural	Urban	Central City
Married Couple w/ Child <18	39.3	33.0	41.9	35.2
Male Householder w/ Child <18	19.5	14.2	21.5	17.0
Female Householder w/ Child <18	15.0	14.5	15.0	13.1
Family Household w/o Child <18	27.2	22.6	29.0	27.5
Non-Family Household	17.5	10.2	19.2	20.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

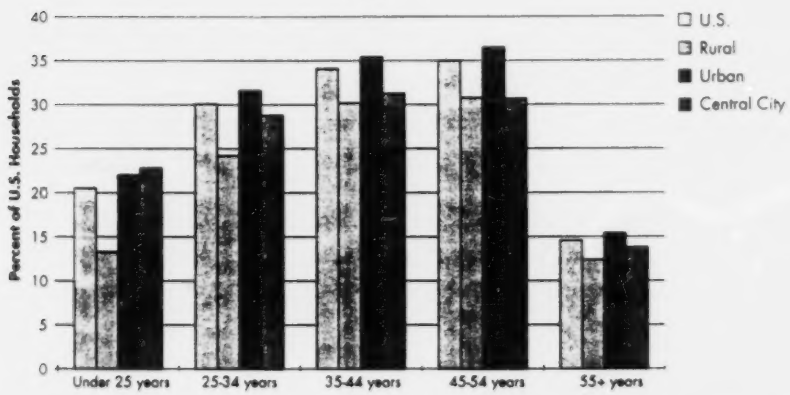
Chart I-27:

Percent of U.S. Households Using the Internet

By Age

By U.S., Rural, Urban, and Central City Areas

1998



	U.S.	Rural	Urban	Central City
Under 25 years	20.5	13.3	22.0	22.8
25-34 years	30.1	24.2	31.6	28.8
35-44 years	34.1	30.2	35.4	31.3
45-54 years	35.0	30.8	36.5	30.7
55+ years	14.6	12.4	15.4	13.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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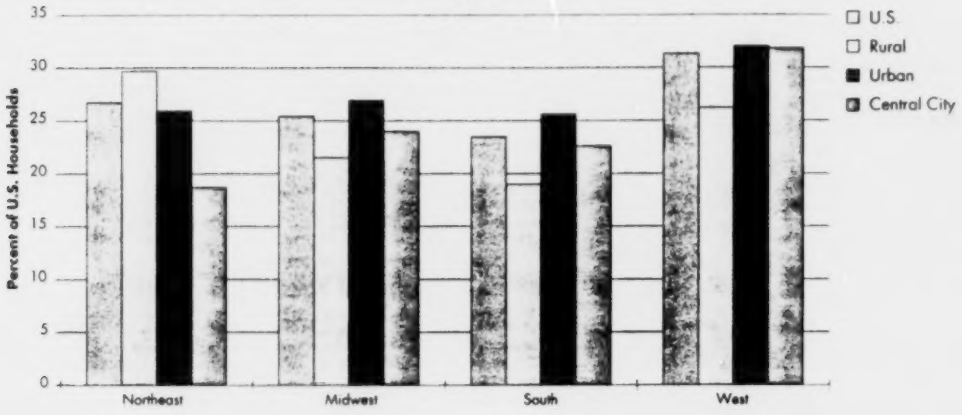
Chart I-28:

Percent of U.S. Households Using the Internet

By Region
By U.S., Rural, Urban, and Central City Areas
1998

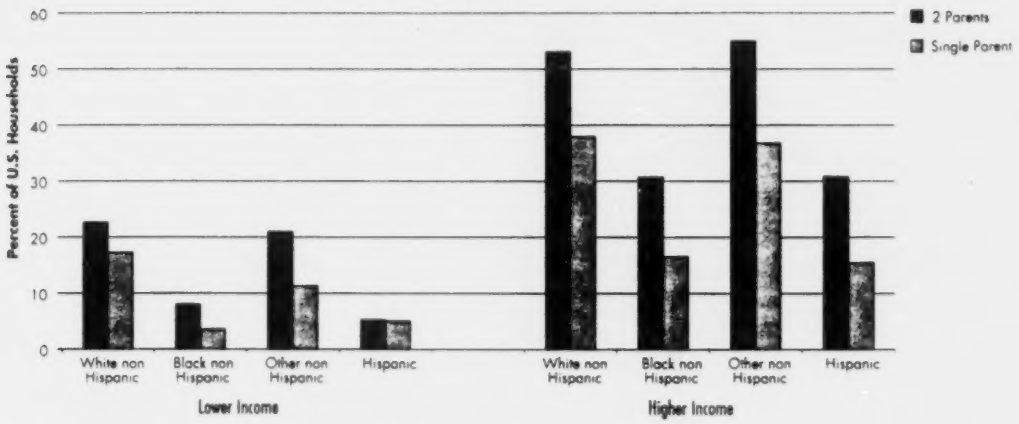


	U.S.	Rural	Urban	Central City
Northeast	26.7	29.7	25.9	18.7
Midwest	25.4	21.5	26.9	24.0
South	23.5	19.0	25.6	22.6
West	31.3	26.2	32.0	31.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

Chart I-29: **Percent of U.S. Households (with Child) Using the Internet At Home**

By Household Type
By Income
By Race
1998



Home Access	Lower Income: <$35,000		Higher Income: >$35,000	
	Two Parents	Single Parent	Two Parents	Single Parent
White non Hispanic	22.6	17.3	53.1	38.0
Black non Hispanic	8.0	3.6	30.7	16.6
Other non Hispanic	21.0	11.3	55.0	36.8
Hispanic	5.3	5.1	30.8	15.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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Table I-3: **Percent of Households with Internet Access, by States: 1998**
(Numbers in thousands.)

State	Total Households with Internet Access	Percent using	90% Confidence Interval
Alaska	95	44.1	4.70
New Hampshire	168	37.1	5.47
Washington	816	36.6	4.87
Utah	241	35.8	4.75
Colorado	534	34.5	4.67
Oregon	427	32.7	4.99
Connecticut	398	31.8	5.52
Vermont	76	31.8	5.31
New Jersey	919	31.3	3.26
Maryland	651	31.0	5.02
California	3,622	30.7	2.05
Arizona	508	29.3	4.68
Minnesota	542	29.0	4.84
Massachusetts	674	28.1	3.69
Virginia	735	27.9	6.07
Hawaii	110	27.9	4.74
Florida	1,670	27.8	2.57
Idaho	122	27.4	4.87
Rhode Island	102	27.1	5.73
Illinois	1,195	26.5	3.02
Nevada	176	26.5	5.19
Indiana	610	26.1	4.92
Maine	134	26.0	5.38
New Mexico	168	25.8	5.03
Kansas	271	25.7	5.02
Michigan	963	25.4	3.19
Wisconsin	513	25.1	4.94
Delaware	73	25.1	5.64
Pennsylvania	1,140	24.9	2.97
Ohio	1,102	24.6	3.10
Texas	1,787	24.5	2.65
Missouri	535	24.3	5.13
Washington, DC	57	24.2	5.50
Georgia	700	23.9	4.50
South Dakota	67	23.9	5.05
New York	1,654	23.7	2.33
Nebraska	149	22.9	5.29
Wyoming	41	22.7	5.26
Iowa	253	21.8	5.16
Alabama	365	21.6	5.10
Montana	75	21.5	4.94
South Carolina	319	21.4	5.43
Tennessee	472	21.3	5.17
Kentucky	335	21.1	5.06
North Dakota	50	20.6	5.41
Oklahoma	264	20.4	4.93
North Carolina	584	19.9	3.79
Louisiana	282	17.8	5.23
West Virginia	132	17.6	4.86
Arkansas	151	14.7	5.25
Mississippi	146	13.6	5.37

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Survey.

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Table I-4(a): **The Growing Digital Divides by Income and Education: 1997-1998**
Personal Computers

Digital Divide by Income*

	1997 Divide (Compared to $75,000+)	1998 Divide (Compared to $75,000+)	Change from 1997-1998 (1998 Divide - 1997 Divide)	% Change from 1997-1998
Under $5,000	59.4	64	-2	7.7%
5,000-9,999	66	67.6	4.6	2.4%
10,000-14,999	63	64	5.5	1.6%
15,000-19,999	58.5	58.7	5.8	.03%
20,000-24,999	52.9	54.2	10	2.5%
25,000-34,999	44.2	44.1	13.8	-0.2%
35,000-49,999	30.3	29.7	14.4	-2.0%
50,000-74,999	15.3	13.6	-1.7	-11.1%

*Table I-4(a) examines the changing digital divide with regard to income for computer ownership. The "1997 divide" and "1998 divide" are the difference between the PC penetration rate for a given income bracket and the penetration rate for the $75,000+ bracket (the standard used here) for both years. The "Change from 1997-1998" represents the change in the gaps between the two years, and is also represented as a percentage increase or decrease from 1997.

Table I-4(b):

Digital Divide by Education*

	1997 Divide (Compared to B.A. or more)	1998 Divide (Compared to B.A. or more)	Change from 1997-1998 (1998 Divide - 1997 Divide)	% Change from 1997-1998
Elementary: 0-8 years	56.4	60.8	4.4	7.8%
Some H.S.: no Diploma	52.3	53	0.7	1.3%
H.S. Diploma/GED	37.5	37.5	0	0.0%
Some College	19.8	19.4	-0.4	-2.0%

*Table I-4(b) examines the changing digital divide with regard to education for computer ownership. The "1997 divide" and "1998 divide" are the difference between the PC penetration rate for a given education level and the PC penetration rate for those with bachelors degrees or higher (the standard used here) for both years. The "Change from 1997-1998" represents the change in the gaps between the two years, and is also represented as a percentage increase or decrease from 1997.

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Table I-4(c): **The Growing Digital Divides by Income and Education: 1997-1998**
Internet Access

Digital Divide by Income*

	1997 Divide (Compared to $75,000+)	1998 Divide (Compared to $75,000+)	Change from 1997-1998 (1998 Divide - 1997 Divide)	% Change from 1997-1998
Under $5,000	42	52.2	10.2	24.3%
5,000-9,999	45.3	54.2	8.9	19.6%
10,000-14,999	44.3	52.9	8.6	19.4%
15,000-19,999	42.2	50.5	8.3	19.7%
20,000-24,999	40.2	48.2	8.0	19.9%
25,000-34,999	35.3	41.2	5.9	16.7%
35,000-49,999	28.4	30.8	2.4	8.5%
50,000-74,999	16.8	16.4	-0.4	-2.4%

*Table I-4(c) examines the changing digital divide with regard to income for Internet access. The "1997 divide" and "1998 divide" are the difference between the Internet access rate for a given income bracket and the Internet access rate for the $75,000+ bracket (the standard used here) for both years. The "Change from 1997-1998" represents the change in the gaps between the two years, and is also represented as a percentage increase or decrease from 1997.

Table I-4(d):

Digital Divide by Education*

	1997 Divide (Compared to B.A. or more)	1998 Divide (Compared to B.A. or more)	Change from 1997-1998 (1998 Divide - 1997 Divide)	% Change from 1997-1998
Elementary: 0-8 years	36.6	45.8	9.2	25.1%
Some H.S.: no Diploma	35.3	42.6	7.3	20.7%
H.S. Diploma/GED	28.8	32.6	3.8	13.2%
Some College	16.5	18.7	2.2	13.3%

*Table I-4(d) examines the changing digital divide with regard to education for Internet access. The "1997 divide" and "1998 divide" are the difference between the Internet access rate for a given education level and the Internet access rate for those with a bachelors degree or higher (the standard used here) for both years. The "Change from 1997-1998" represents the change in the gaps between the two years, and is also represented as a percentage increase or decrease from 1997.

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PART II

INTERNET ACCESS AND USAGE

A. INTRODUCTION

This section provides an in-depth examination of Internet (or Net) access and usage. In contrast to Part I, which looks at household access, Part II focuses primarily on trends among *individuals*. This is a new analysis in the *Falling Through the Net* series, which we have included for at least two related reasons. First, given the Internet's "robust growth", the Internet has assumed an importance in Americans' everyday lives that compels us to probe more deeply into this new medium. Second, a sufficient number of people are now online, enabling meaningful surveying and statistically significant analyses.

Many of the findings in this new section will be useful to the stakeholders in the new Information Age. They may be particularly useful for policymakers concerned with ensuring affordable access to the Internet. Key findings include:

- Despite the Internet's only recent emergence as a new media, approximately one-third of all Americans already have Internet access from some location, either at home or outside of the home. Almost one-fourth of Americans have access at home.

- Whites are more likely to have Internet access *at home* than Blacks or Hispanics are from *any* location.

- Approximately two-thirds of households with PCs or WebTVs*[1] have Internet access. Those households that do not have Internet access cite "cost" or the fact that they "don't want it" as leading reasons for never having used the Internet. Cost is also the leading reason for discontinuing Internet use.

- Americans' use of the Internet varies tremendously among demographic groups. E-mail, however, overwhelmingly represents the most popular type of use for all groups, whether access occurs at home (three-fourths) or at an outside location (almost two-thirds).

- Groups that are less likely to have Internet access at home or work (such as certain minorities, those with lower incomes, those with lower education levels, and the unemployed) tend to access the Internet at public facilities, such as schools and libraries. These same groups also tend to engage in online activities that can result in their economic advancement, such as taking educational courses, engaging in school research, or conducting job searches.

The Internet is a nascent, rapidly diffusing technology that promises to become the economic underpinning for all successful countries in the new global economy. Understanding who is connected to the Net, and how it is being used, is critical to the development of sound policies in this area. In the sections that follow, we examine both Internet access and its usage through a variety of measurements

[1] For the first time in these studies, NTIA sought information regarding means of accessing the Internet other than personal computers. The Census CPS survey asked respondents whether they owned a WebTV®, which is the most widely used system for accessing the Internet through television sets. A WebTV® unit connects to a television set, much like a VCR, and to a telephone line to send and receive data. This data is then displayed on the television, rather than a computer monitor. WebTV® Networks, Inc. is a subsidiary of the Microsoft Corporation. We note that WebTV® is not the only vendor of non-PC based access to the Internet.

B. WHERE PEOPLE ACCESS THE INTERNET

1. General Access to the Internet

Many people have the option of accessing the Internet from more than one place. A person can connect from home; select another site, such as at work, a school, library, or community center; or use a combination of the two. Among all Americans, 22.2% currently use the Internet at home, and 17.0% use it at some site outside the home. Almost one-third (32.7%) use the Internet somewhere, while approximately two-thirds (67.3%) do not use it at all. (Chart II-1)

Demographic and Geographic Variables. Levels of Internet access differ dramatically among different groups and geographic areas. A cross-sectional analysis based on the seven variables set forth below illustrates this theme. Where a given variable is cross-tabulated with the degree of urbanization (such as rural or central city), significant differentials also typically occur.

- ***Income.*** As a basic proposition, usage of the Internet is directly related to one's income level. (Chart II-2) For those at the lower end of the income scale ($5,000-9,999), 12.1% use the Internet, either at home or at an outside location. This contrasts with 58.9% of those in the highest bracket ($75,000+) accessing the Internet at any location. *Id.* Where one accesses the Internet also correlates with income levels. Thus, persons with incomes of less than $35,000 use the Internet more often outside the home, while the reverse is true for those earning $35,000 or more annually. *Id.*

- ***Race/Origin.*** How often and where the Internet is used differ by race or ethnic origin. Whites (37.7%) and Asians/Pacific Islanders (35.9%) use the Internet much more than Blacks (19.0) and Hispanics (16.6%). (Chart II-3) Only Asians/Pacific Islanders and Whites have relatively greater access at home, while American Indians/Eskimos/Aleuts, Blacks, and Hispanics more often turn to access outside the home. *Id.* In fact, Blacks and Hispanics are less connected everywhere (such as at home, school, library, or community center) than Whites are at home. (Charts II-4, II-6) Internet usage is affected by geography, as well as by race. Households of all races lag significantly in Internet access — whether at home, outside home, or for any location — in rural areas. Regarding home access, the highest usage is by urban Whites (29.4%), while the least usage is found among rural Blacks (6.3%). (Chart II-4) Outside the home and at any location, respectively, the pattern is similar, with the two extremes being represented by Whites in central cities (21.8%, 41.3%) and rural Blacks (8.2%, 12.8%). (Charts II-4, II-5, II-6)

- ***Education.*** The level of education and Internet usage are highly correlated. Considering any access site, least usage occurs among those persons with an elementary school education or less (6.6%). (Chart II-7) Those with four-year college degrees have a usage rate more than nine times higher (61.6%). *Id.*

- ***Household Type.*** In terms of total (home and external) Internet access, married couples with children less than eighteen years of age exhibit the highest usage among all household groups (37.6%), while female householders with children have the least (22.3%). (Chart II-8) Married couples and family households without children use the Internet at home more than elsewhere. This contrasts with families led by single males and females, which typically make greater use outside the home. *Id.* This pattern holds true no matter where the single-parent families live, except that single fathers in urban areas use the Internet more at home than outside the home. (Charts II-9, II-10) Factoring in location also produces new highs and lows. At the highest end are

urban married couples with children (38.4%) and at the lowest are female-headed households in central cities (18.8%) for access at any location. (Chart II-11)

- ***Age.*** Internet usage rises with age until people reach their senior (55+) years. Seniors not only change the pattern, but actually rank lowest among all age groups, whether at home (11.0%), away from home (5.5%), or at any location (14.4%). (Chart II-12) The highest usage at home is among 35-44 year-olds (29.2%), but 25-34 year-olds lead all others in terms of external access or usage anyplace. *Id.*

- ***Region.*** The West leads in at-home (25.1%) and total (35.5%) usage. The Midwest ranks above others in non-home access. (Chart II-13) The South trails in all three categories of home (20.0%), outside the home (15.6%), and total usage (29.8%). *Id.*

- ***Gender.*** Both sexes use the Internet more at home than elsewhere. (Chart II-14) Males generally access the Internet by about three percentage points more, regardless of location, and equal 34.3% in total access. *Id.*

This discussion has attempted to present a broad assessment of which Americans access the Internet. In the section that follows, we narrow the focus to patterns of access for those who go online at sites other than home.

2. Points of Access Outside the Home

Of those people who go online outside the home, there are significant differences as to where people access the Internet. Certain demographic groups are particularly likely to have access at work. Those same groups are far less likely to access the Internet at schools, public libraries, or through someone else's computer. The converse is also true. Those groups with lower access rates at work or at home are far more likely to use the Internet at a public place, such as a school, library, or a community center. These findings suggest that Americans without ready access to the Internet (at home or at work) are making use of public resources.

Access At Work

By far the most popular place to access the Internet outside the home is at work. Of those who access the Internet outside of home, more than half (56.3%) of Americans access it at work, particularly in urban (58.8%) and central city (58.7%) areas. (Chart II-15) Certain groups have particularly high rates of access at work. Those with college or advanced degrees are the most likely to have access at work — about *ten times* more likely than those with only some high school education (87.2% versus 8.7%). (Chart II-20) Similarly, those earning at least $75,000 are nearly *six times* more likely to have work access than those earning less than $5,000 (72.9% versus 12.3%). (Chart II-16) Families without children and non-family households who access the Internet externally also rank high in accessing the Internet from work — 69.4% and 68.4%, respectively (compared to 32.8% for male-headed households, 29.0% for female-headed households, and 50.4% for dual-parent households). (Chart II-21)

There are also notable disparities based on race. Whites and Asians/Pacific Islanders who use the Net outside the home are more likely to be connected at work (58.8% and 56.6%, respectively),

compared to American Indians/Eskimos/Aleuts, Hispanics, and Blacks (34.8%, 39.1%, and 49.3%, respectively). (Chart II-17) Men are also more likely than women to access the Internet at work (58.7% compared to 53.8%). (Chart II-22)

Not surprisingly, those demographic groups with higher access from work tend to be the same groups that have higher rates of access at home. (See discussion above.) They are also the same groups that exhibit lower usage rates from public access points, such as schools, libraries, or community centers.

Access At K-12 Schools

The second most frequently used access point is the Kindergarten through 12th grade (K-12) school, particularly in rural areas (30.0%). (Chart II-15) These figures may be higher than other public access points because they include school-aged children, many of whom use the Internet at school. The inclusion of children who access the Internet at school could account, in part, for the particularly high levels of usage among those with lower education levels, lower incomes, and those "not in the labor force." (Charts II-20, II-16, and II-23)

Nevertheless, certain groups who access the Internet outside the home are particularly likely to go online at K-12 schools. American Indians/Eskimos/Aleuts and Hispanics are particularly high users (36.5% and 35.1%, respectively), compared to Asians/Pacific Islanders (19.4%), Whites (20.0%), and Blacks (26.6%). (Chart II-17) Hispanics and American Indians/Eskimos/Aleuts are especially likely to use schools for access if they live in rural areas (*e.g.*, 46.6% for Hispanics). (Chart II-18) Single-parent households are also far more likely to use K-12 schools (43.6% for female-headed households, 38.5% for male-headed households), than are dual parent households (33.7%), families without children (5.8%), or non-family households (4.3%). (Chart II-21)

Access At Public Libraries and Community Centers

Many Americans who obtain Internet access outside the home rely on such places as public libraries (8.2%) and community centers (0.6%). (Chart II-15)[2] Public libraries, in particular, are used by certain groups with some regularity. Unemployed persons who access the Internet outside their homes are nearly *three* times more likely to use public libraries as the national average (21.9% versus 8.2%). (Chart II-15, II-23) Those Americans who are "not in the labor force," such as retirees or homemakers, are twice as likely to use the public libraries for access (16.1%). Both groups are even more likely to use public libraries in urban, as opposed to central city or rural, areas (22.8% and 17.9%, respectively).

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[2]Community centers are generally a new and growing point of access to the Internet. We are unable to conduct an independent, meaningful analysis of those Americans using community centers, however, because the numbers involved generally fall below statistical levels of significance. Nevertheless, the Census Bureau data suggest that — as with public libraries — community centers are used more often by low-income persons, Blacks, American Indians/Eskimos/Aleuts, and the unemployed, than by other groups.

Other groups that also use public libraries more frequently include those earning less than $25,000 (Chart II-16), those with less than a high-school education (Chart II-20), those in female-headed households (Chart II-21), and American Indians/Eskimos/Aleuts, Blacks, and Hispanics. (Chart II-17) Of these groups, American Indians/Eskimos/Aleuts are especially likely to use libraries in urban areas (17.3%), while Blacks are more likely to use libraries in rural areas (16.3%). Those in female-headed households are also more likely to gain Internet access in libraries in central cities (16.4%).

Using a logistic regression analysis, we also compared the likelihood of a group's using public libraries or community centers for online access. Our analysis pertained only to those people who reported usage of the Internet from outside the home.[1] This regression analysis revealed the additional interesting comparisons:

- Those earning less than $20,000 who use the Internet outside the home are two times more likely (2.12 times) to get their access through a public library or community center than those earning more than $20,000.
- Blacks using the Internet outside the home are nearly two times more likely (1.91 times) to use a public library or a community center as Whites. "Other non-Hispanic" minorities (including Asians/Pacific Islanders, American Indians, Eskimos, and Aleuts) are 1.24 times more likely to use these resources as Whites.
- People without home computers are almost 1.5 times more likely than people with home computers to get outside access to the Internet through public libraries or community centers.
- People without college degrees are also significantly (1.4 times) more likely to use public libraries or community centers for their outside Internet access than those who have earned a college degree.

These findings support our general conclusion that those who are less likely to have Internet access at home or work (*e.g.*, those earning less than $20,000, certain minorities, and those without a college degree) are relying on the resources of public facilities.

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[1] The logistic regression analysis was conducted according to the model set forth in the methodology section of the report. Logistic regression analysis requires a base reference group for purposes of comparison. The base group in this analysis is higher income, White-non Hispanic, suburban, computer owner, and college educated. The dependent variable indicates whether someone has used the Internet from a public library or community center. The number of respondents who used the Internet at a community center was relatively small by itself. By combining them with public libraries, community centers could be included in the analysis.

The sample was broken into two groups by income: those making above $20,000 a year and those making below. The $20,000 threshold isolates households in poverty from those with higher incomes. The race variables were disaggregated to separate Hispanics from all racial groups. Hispanics were then added into the regression. In the model "Minorities" are considered to be all non-Hispanics not included in Black or White racial groups.

The sample was also broken down into two segments: by suburban and non-suburban, with non-suburban combining non-metropolitan (rural) and central cities. Education was broken down into two categories: one for those who graduated from college and another for those who did not. The "computer at home" variable indicates whether or not households have a computer at home.

The fit of the model is significant with the Hosmer and Lemeshow Goodness-of-fit test statistic of 7.6733 with 7 degrees of freedom ($p = 0.3623$). The model also shows relatively low collinearity due to the breakdown of the binary variables.

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C. HOW HOUSEHOLDS ACCESS THE INTERNET

1. Type of Internet Access Device

The 1998 Census survey also asked how people access the Internet from home. Personal computers with modem capability have been historically, and are currently, the mode of choice for Internet access. Among those households that have a computer or a WebTV*, 61.0% connect to the Internet via PCs, 1% obtain access via WebTV*, and 38.0% do not use the Internet at all. (Chart II-24a) [4] Already there are signs that alternative modes — for example, Internet phones — will soon become available for browsing the web or e-mailing.

Whether or not a household with a PC is also an Internet user depends on various demographic characteristics. For instance, usage varies by race/origin, ranging from high levels of use by Asians/Pacific Islanders (65.0%) and Whites (63.5%) to lower usage levels by American Indians/Eskimos/Aleuts (53.2%) to Hispanics (48.7%) and Blacks (47.4%). Breakdowns by type of household also reveal differing usage rates, ranging from married couples with children (63.4%) to single-parent households with children, either male-headed (55.2%) or female-headed (46.4%) families.

2. Type of Internet Service Provider

An important part of the linkage in being able to go online is to connect to an Internet Service Provider (ISP). Currently there is a tremendous variation in market share among the types of ISPs to whom households choose to subscribe. (Chart II-24b) National service providers have captured the bulk (69.0%) of the market. Local phone companies rank second (14.0%), followed by long distance companies (4.0%), cable TV systems (2.0%), and wireless firms (1.0%). An "other" category, comprised of types of Internet Service Providers (ISPs) that are too small to be broken out, accounts for the rest of the total (10.0%).

3. Why Households with Computers Have Never Had Internet Access

Multiple reasons exist as to why households with computers at home have never used the Internet there. [5] (Chart II-25) In the 1998 CPS supplement survey, the most common response given was that the household's occupants "don't want" such access (25.7%). The second major reason among respondents concerns "cost" (16.8%), which is further disaggregated into the monthly service charge (9.7%), the need to make a toll call in order to reach one's ISP (4.8%), and other costs (2.3%). Following cost are such categories as "can use elsewhere" (9.6%), "no time" (8.7%), "computer not capable" (8.3%), "future access planned" (but none at home currently) (7.5%), "concern with children" (6.0%), and "not useful" (5.6%). Some people gave "not user friendly" (2.7%) and "problem with service provider" (1.3 %) as reasons for not having Internet access at home. Myriad other responses whose percentages are quite small appear under the headings "other cost" and "other". *Id.*

[4] Because of the small percentage of households with WebTV*, the term "PCs" includes WebTVs* for purposes of this section.

[5] The CPS supplement questionnaire asked respondents to provide the main reason for non-use.

These profiles were gleaned from an analysis of Internet "non-users" by demographic variables.

- ***Income.*** Not surprisingly, the lower a household's income, the more likely a household cites 'cost' as the reason for not having Internet access. Thus, 7.2% of those with incomes of $75,000 or more cited cost as a reason for no usage, contrasted with 33.2% for the $5,000 to $9,000 bracket. (Chart II-26) The "don't want it" response generally increases with income, with a few exceptions. *Id.*

- ***Race/Origin.*** The cost factor is most important to Hispanics (23.4%), surpassing the "don't want it" response (19.6%). (Chart II-27) However, "don't want it" ranks higher than cost in the case of Whites (26.7% versus 15.6%), Blacks (24.0% versus 22.0%), and "Other" (21.8% versus 17.4%). *Id.* The reason "can use elsewhere" is much less important to all except for "Other non Hispanic" households (15.1%). *Id.*

- ***Education.*** Generally, cost becomes more important the lower the level of education. (Chart II-28) The response "don't want it" generally increases, as levels of education decreases. *Id.* Viewed head-to-head, "don't want it" dominates across all education levels relative to cost and "can use elsewhere." For example, this holds for the least educated (33.3% versus 25.3% versus 1.3%) and for the most educated (24.2% versus 13.2% versus 16.7%). *Id.* Solely in the case of those with a college education, "can use elsewhere" ranks higher than cost. *Id.*

- ***Household Type.*** Cost is the most important factor for single-parent families, both compared to other types of households and relative to other reasons for non-use of the Internet. (Chart II-29) For male householders with children, cost (23.2% of respondents) exceeds "don't want it" (18.7%). *Id.* A similar scenario exists for female householders with children (29.4%, 19.4%). *Id.* For all other household types, the reverse is true, *i.e.*, "don't want it" is a more important reason than cost. *Id.*

- ***Age.*** Cost prevails as the biggest reason for not having Internet access (20.4%) for those householders under 25 years old, although "can use elsewhere" is a close second (19.1%). (Chart II-30) For other age groups, "don't want it" prevails, by a modest amount through 44 years old and much more significantly for 45-54 years and particularly 55 and older (35.7% versus 12.1%). *Id.*

- ***Employment.*** One's labor force status affects reasons for non-use as well. Far and away the most important reason for abstention by the unemployed work force is the cost factor (38.2%), dwarfing "don't want it" at number two (13.3%). This contrasts with employed workers, where "don't want it" prevails over "cost" (25.5% versus 16.5%). (See CPS data base.)

In sum, the most important reasons why certain households have never used the Internet is that they "don't want it" or it is too expensive. Although the former is the more important reason overall, the cost factor dominates among low-income groups, Hispanics, single-parent families, the youngest householders, and the unemployed. Policymakers should therefore consider the role of cost as a deterrent to expanding online access.

4. Why Households with Computers Have Discontinued Internet Use

Internet churn — the incidence of households discontinuing Internet use — represents another area that policymakers have begun to examine. In the 1998 CPS supplement survey, respondents identified "cost, too expensive" (15.0%) as the most important reason for dropping off the Internet. (Chart II-31) The second most compelling reason is "no longer owns computer" (14.0%), followed by "not enough time to use it" (10.0%), followed by "can use elsewhere" (9.0%), "don't want it" (7.0%), and "moved" (7.0%). "Other" accounts for the rest (17%). *Id.*

D. HOW PEOPLE USE THE INTERNET

The 1998 data also reveal that demographic characteristics not only determine *whether* and *where* one uses the Internet, but *how* a person uses the Internet. Income, education, race, and gender, among other characteristics, strongly influence what a person does online. They can affect not only the types of Internet activities and searches, but even the nature of a person's e-mail. This is true regarding both Internet use at home and Internet use outside the home.

Most significantly, people are using the Internet to improve and advance their current status. For example, those who are unemployed are using the Internet to find jobs, and those with lower incomes and many minorities are using the Internet to take courses or do school research. The data therefore show the Internet is becoming not only a source of information, communication, and entertainment, but also a tool that can help users help themselves.

1. Internet Use at Home

E-mail is one Internet use, however, that transcends all demographic and geographic boundaries. E-mail is clearly the "killer application" of the Internet for the 1990s. Of Americans who use the Internet, nearly 80 percent (77.9%) use it to send e-mail, and over half (53.6%) of people with Internet access outside the home use the Internet for e-mailing. (Charts II-32, II-37) The numbers are consistently high, regardless of income, race, gender, age, or any other characteristic.

Apart from e-mail, however, there are distinct differences in the ways people use the Internet at home. Using the Internet for "job-related tasks" is far more common, for example, for those at incomes higher than $25,000 and for those at higher education levels. (Charts II-33, II-35) Job-related uses are also higher for men (38.7%) than for women (26.4%). (Chart II-49)

Taking courses or finding jobs are important activities, on the other hand, among minorities, the young, Americans with lower incomes, and the unemployed. At home, minorities, for example, are taking courses or conducting school research online at rates higher than the national average (36.1%) or than Whites (at 35.3%). Blacks and Hispanics rank highest at 43.5%, followed by American Indians/Eskimos/Aleuts (42.9%), and Asians/Pacific Islanders (41.1%). (Chart II-33, II-34) Minorities are much more likely than Whites to use the Internet to search for jobs (19.1% for Blacks, 18.1% for Asian/Pacific Islanders, 17.4% for Hispanics, compared to 13.2% for Whites). *Id.*

Similarly, well over half of unemployed persons using the Internet at home are searching for jobs online (53.9%). (Chart II-36) They are also using the Internet to take courses at far higher rates than individuals who are who are employed (40.1% versus 26.8%). *Id.* Taking courses and searching for jobs also rank high among the young, those with lower education levels, and those with lower incomes. These groups probably have relatively higher rates, however, because they include a large number of students.

2. Internet Use Outside the Home

Americans who use the Internet tend to use it for somewhat different purposes when outside the home than at home. Nationwide, people are far less likely to use the Internet outside the home to e-mail (53.6% versus 77.9% at home), check the news (23.3% compared to 45.9%), search for jobs (8.5% outside home, 13.8% at home), or pay bills or shop (7.5% , compared to 24.6% at home). (Charts II-34, II-37) On the other hand — not surprisingly, given the numbers who access the Internet at work — conducting job-related tasks online is much more likely outside the home than at home (44.6%, compared to 29.0%). (Chart II-37) Again, this use is far more common among people of higher incomes and education levels. (Charts II-38, II-40)

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The one activity that is equally popular for both at-home or outside-the-home Internet users is pursuing online courses and school research (38.8% outside home, compared to 36.1% at home). Again, minorities are more likely users and pursue online courses and school research at even higher rates outside the home (50.3% for Hispanics, 47.0% for American Indians/Eskimos/Aleuts, and 46.3% for Blacks). (Charts II-32, II-37, II-39) People in rural areas also taking courses at higher rates (45.4%), compared to those in central cities (36.8%) or urban areas (36.9%). Finally, households with children are also more likely to take online courses than those without children, with female-headed households being the leading users (57.3%). (Chart II- 41)

While Americans as a whole are unlikely to use the Internet outside the home to search for jobs, there is a particularly notable exception — the unemployed. As a whole, this group is more than *three times* more likely to use the Internet for job searching than the national average (29.1% *v.* 8.5%), and is more than *four times* more likely (34.9%) to do so in central cities. (Charts II-32, II36) This finding is especially significant, given that this group does not have the option to access the Internet at work and must rely on other access points, such as public libraries.

3. E-mail Use

As noted above, most Americans with Internet access are using the Internet to send e-mail. The nature of those e-mails, however, can again vary widely by demographic characteristics: certain people are more likely to use it for educational purposes; others are more likely to use it to buy goods; still others are more likely to use it for job-related purposes.

Nevertheless, there is one constant: almost all Americans who use e-mail at home are using it to communicate with family and friends (93.6%), and a significant percentage (59.7%) are using it outside the home for the same purpose. (Charts II-43, II-50) At home, the same high usage rate generally holds true across all income levels, education levels, races, ages, genders, and locations. (Charts II-43-49) For Americans who access the Internet outside the home, the rate of sending e-mail to family and friends declines as income rises: more than 65% of those earning less than $25,000 use e-mail for this purpose, while that rate declines at higher income levels. (Chart II-51)

E-mailing for job-related purposes is also popular. It is obviously common for outside-the-home users (70.6%), but is also frequent for at-home users as well (32.8%). (Charts II-50, II-43) As with job-related Internet use, this type of e-mailing occurs more often at higher income levels (Charts II- 44, II-51), and higher education levels. (Charts II-46, II-53) It also occurs at higher rates for men than women, both at home (38.7% versus 26.4%) and outside the home (74.6% versus 66.2%). (Charts II-49, II-56)

Other distinctions have also emerged between the way men and women use e-mail. Men are more likely to e-mail regarding hobbies or special interests — whether at home (34.5% versus 28.5%) or outside the home (13.0% versus 9.9%). (Charts II-49, II-56) They are also using e-mail for commercial uses more than women: 13.7% compared to 10.0% for at-home uses, and 11.1% compared to 7.6% for outside-the-home uses. *Id.*

4. Online Confidentiality Concerns

The frequency with which Americans purchase goods online, send e-mail, conduct research, or undertake any other Internet activity may be affected by their concerns about confidentiality online. As a whole, Americans are very wary about confidentiality on the Net. When asked about these concerns, by far the highest percentage of those polled (40.0%) stated that they were "very concerned" about confidentiality on the Internet. (Chart II-57) Equal numbers (24.0%) responded that they were "somewhat concerned" or "not concerned." *Id.*

The level of concern varies by race/ethnic origin, as well as other demographic characteristics. Indeed, Whites (40.5%) and Blacks (39.1%) are "very concerned," while Asians/Pacific Islanders are the least likely to be "very concerned" (31.5%), followed by Hispanics (34.5%). (Chart II-58) Of all groups, Hispanics are most likely (31.5%) to say they are "not concerned" at all about confidentiality. *Id.*

The level of education and income are also factors in levels of concern about online confidentiality. Those with a high school diploma or some college education are the most likely to be "very concerned" (41.8% and 43.5%, respectively). (Chart II-59) Similarly, those earning between $25,000 and $50,000 expressed high levels of concern (above 44.0%).

To sum up, the groups that express more serious concern are the same groups that are using the Internet more frequently. However, those using the Internet the most — those with college degrees, those earning $75,000 or more, and Asians/Pacific Islanders — have expressed slightly lower degrees of concern. Whatever the reasons for these patterns, it appears that concern arises among those with mid-level usage rates, while there is a higher comfort level among those using the Internet most often.

E. CONCLUSION

For the first time in our *Falling Through the Net* series, the Commerce Department has collected and analyzed wide-ranging data with respect to Internet usage by Americans. These statistics will advance our knowledge base with respect to whether, where, and how people in this country are making use of the Internet.

These data provide concrete evidence that the Internet is being used by an increasing number of Americans. More than one-third of Americans go online from any point, either at home or outside the home. Approximately one-quarter access the Internet at home. For those households with a computer, approximately two-thirds have Internet access. Households that do not have Internet access most frequently explain that they either do not want it or that it is too expensive; for those households that have dropped off the Net, cost is the most important reason.

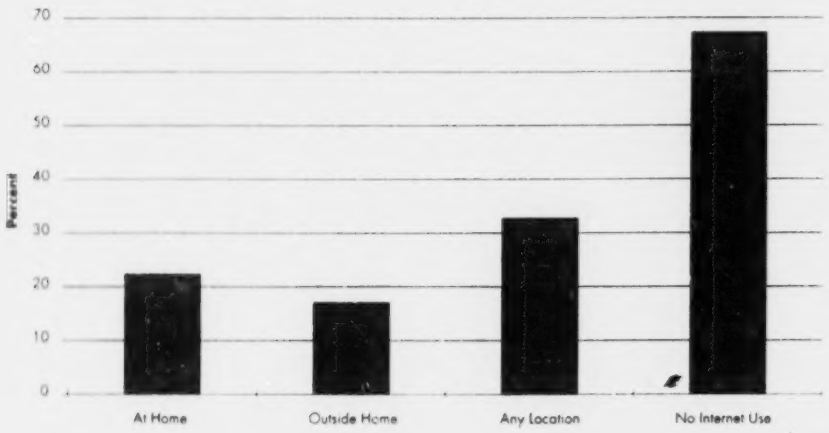
While Americans are becoming increasingly connected, there are still significant discrepancies in access: Blacks and Hispanics, for example, are less connected anywhere than Whites are at home. Those groups with lower access rates at work or home are much more likely to use the Internet at a public place such as a school, library, or community center. They are also more likely to use the Internet to take courses or to conduct job searches than other groups. These and other findings — present and future — will provide an important factual foundation for the sound policymaking needed to ensure socioeconomic success in the Information Age.

Chart II-1:

Percent of U.S. Persons Using the Internet

By Location

1998



	At Home	Outside Home	Any Location	No Internet Use
U.S. Persons	22.2	17.0	32.7	67.3

Source: National Telecommunications and Information Administration and U.S. Census Bureau, U.S. Department of Commerce, December 1998 Current Population Surveys.

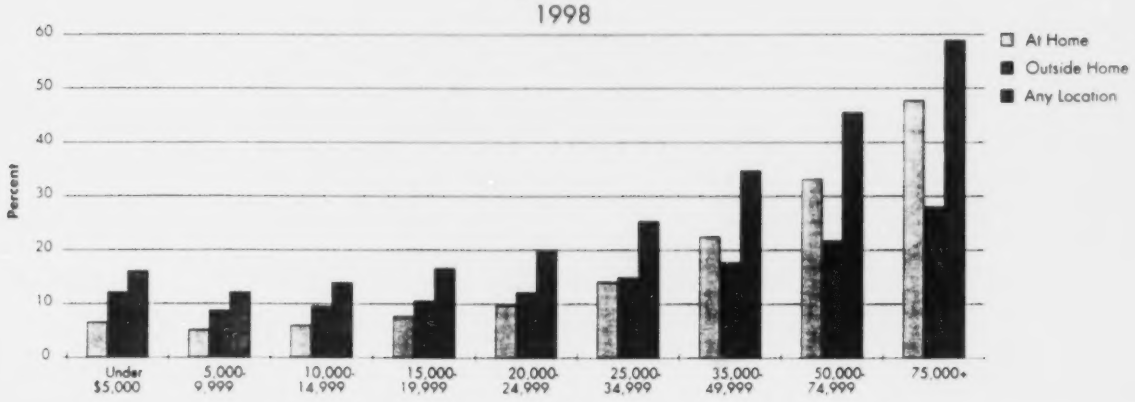
Chart II-2:

Percent of U.S. Persons Using the Internet

By Income

By Location

1998



	At Home	Outside Home	Any Location
Under $5,000	6.5	12.1	16.0
5,000-9,999	5.1	8.7	12.1
10,000-14,999	6.0	9.5	13.9
15,000-19,999	7.7	10.5	16.6
20,000-24,999	9.9	12.1	19.9
25,000-34,999	14.1	14.9	25.3
35,000-49,999	22.5	17.7	34.7
50,000-74,999	33.1	21.7	45.5
75,000+	47.7	28.0	58.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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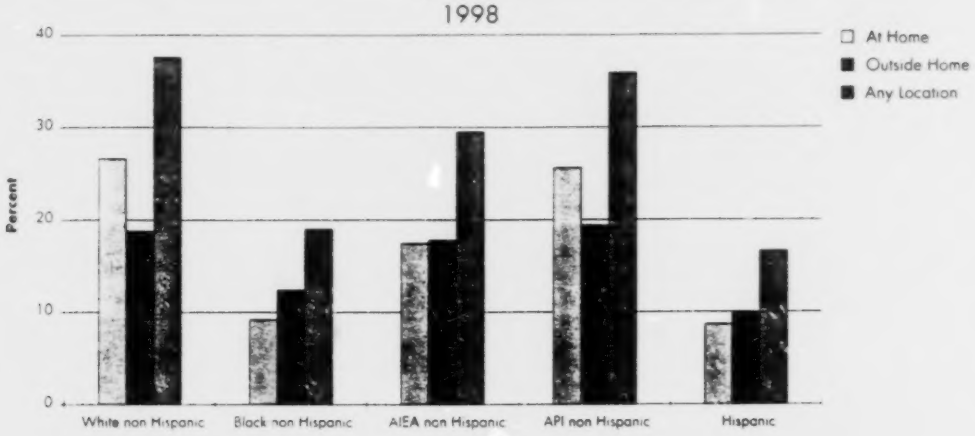
Chart II-3

Percent of U.S. Persons Using the Internet

By Race/Origin
By Location
1998



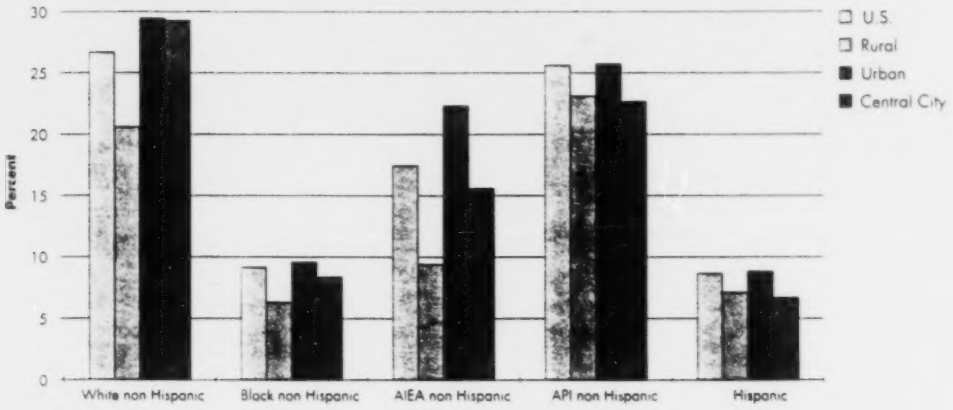
	At Home	Outside Home	Any Location
White non Hispanic	26.7	18.8	37.7
Black non Hispanic	9.2	12.4	19.0
AIEA non Hispanic	17.5	17.8	29.5
API non Hispanic	25.6	19.4	35.9
Hispanic	8.7	10.0	16.6

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-4:

Percent of U.S. Persons Using the Internet At Home

By Race/Origin
By U.S., Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
White non Hispanic	26.7	20.6	29.4	29.3
Black non Hispanic	9.2	6.3	9.6	8.4
AIEA non Hispanic	17.5	9.4	22.3	15.6
API non Hispanic	25.6	23.1	25.7	22.7
Hispanic	8.7	7.1	8.8	6.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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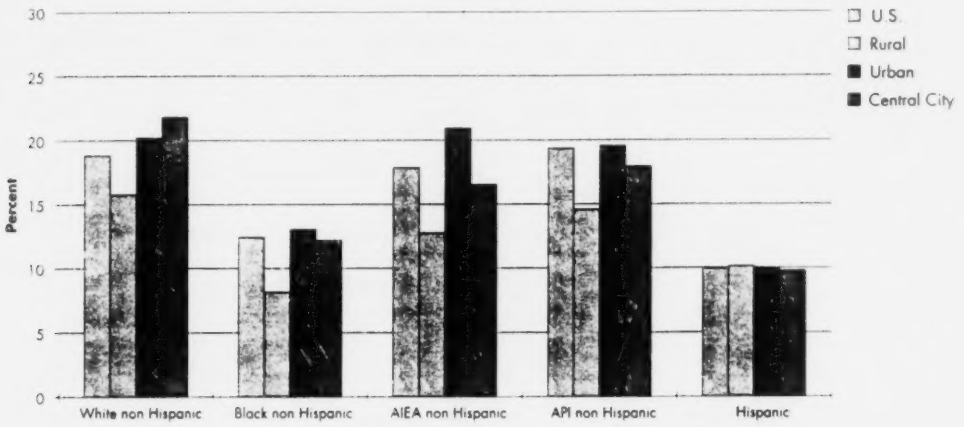
Chart II-5: Percent of U.S. Persons Using the Internet Outside the Home

By Race/Origin
By U.S., Rural, Urban, and Central City Areas
1998

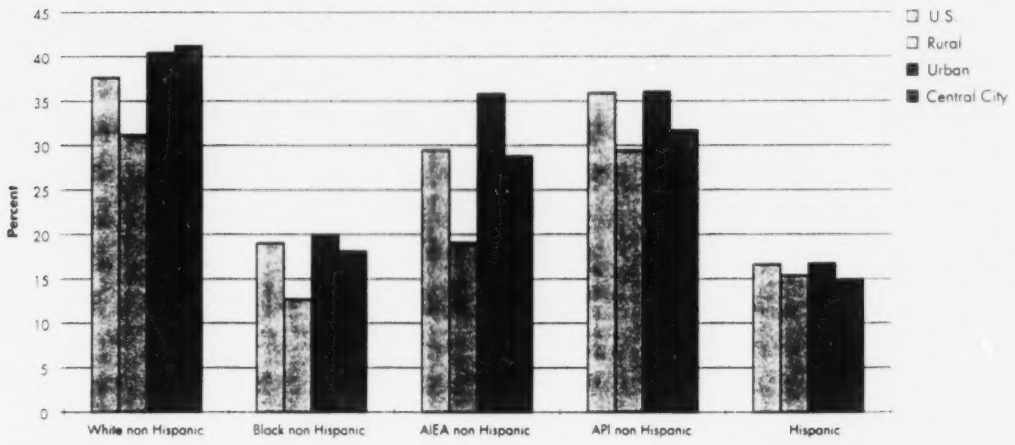


	U.S.	Rural	Urban	Central City
White non Hispanic	18.8	15.8	20.2	21.8
Black non Hispanic	12.4	8.2	13.0	12.2
AIEA non Hispanic	17.8	12.8	20.9	16.5
API non Hispanic	19.4	14.6	19.6	18.0
Hispanic	10.0	10.1	9.9	9.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-6: Percent of U.S. Persons Using the Internet From Any Location

By Race/Origin
By U.S., Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
White non Hispanic	37.7	31.3	40.6	41.3
Black non Hispanic	19.0	12.8	19.9	18.1
AIEA non Hispanic	29.5	19.1	35.8	28.8
API non Hispanic	35.9	29.5	36.2	31.9
Hispanic	16.6	15.4	16.8	14.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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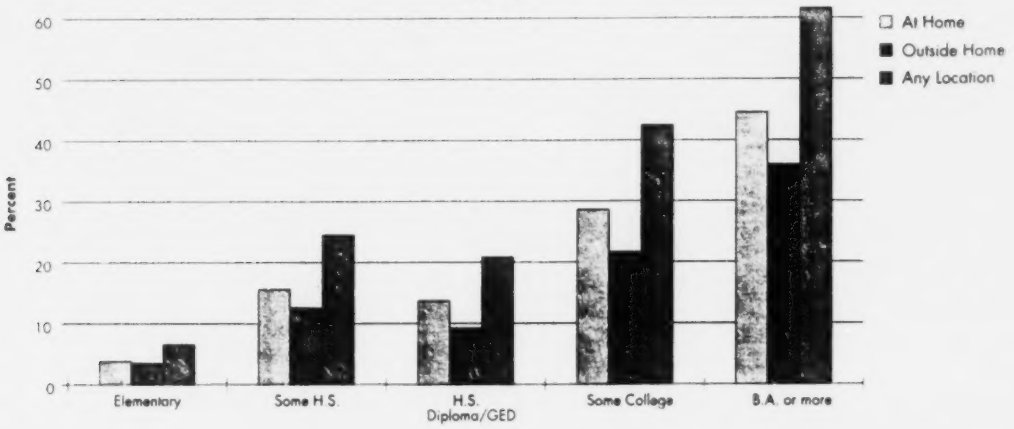
Chart II-7:

Percent of U.S. Persons Using the Internet

By Education
By Location

1998



	At Home	Outside Home	Any Location
Elementary	3.8	3.6	6.6
Some H.S.	15.6	12.6	24.6
H.S. Diploma/GED	13.8	9.3	20.9
Some College	28.7	21.7	42.5
B.A. or more	44.6	36.0	61.6

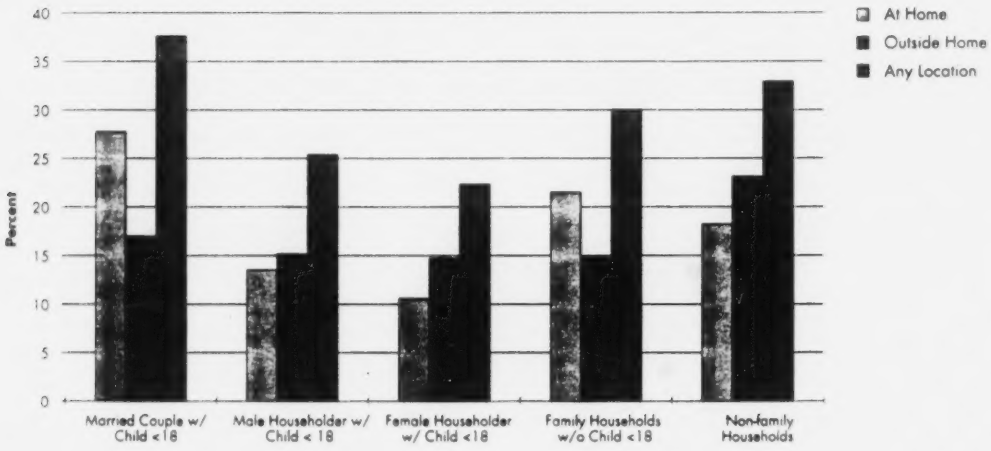
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-8:

Percent of U.S. Persons Using the Internet

By Household Type
By Location

1998



	At Home	Outside Home	Any Location
Married Couple w/ Child <18	27.7	17.0	37.6
Male Householder w/ Child < 18	13.5	15.2	25.4
Female Householder w/ Child <18	10.6	14.7	22.3
Family Households w/o Child <18	21.5	14.8	30.0
Non-family Households	18.2	23.1	32.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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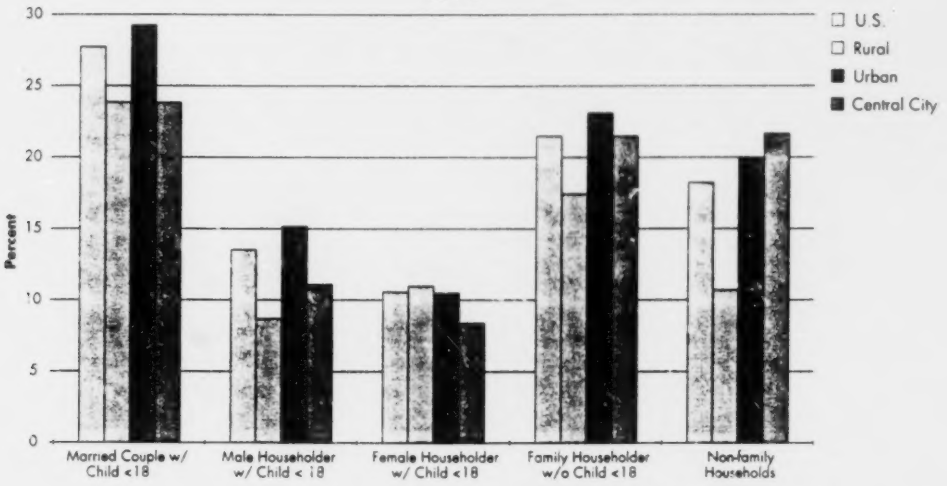
Chart II-9:

Percent of U.S. Persons Using the Internet At Home

By Household Type
By U.S., Rural, Urban, and Central City Areas
1998



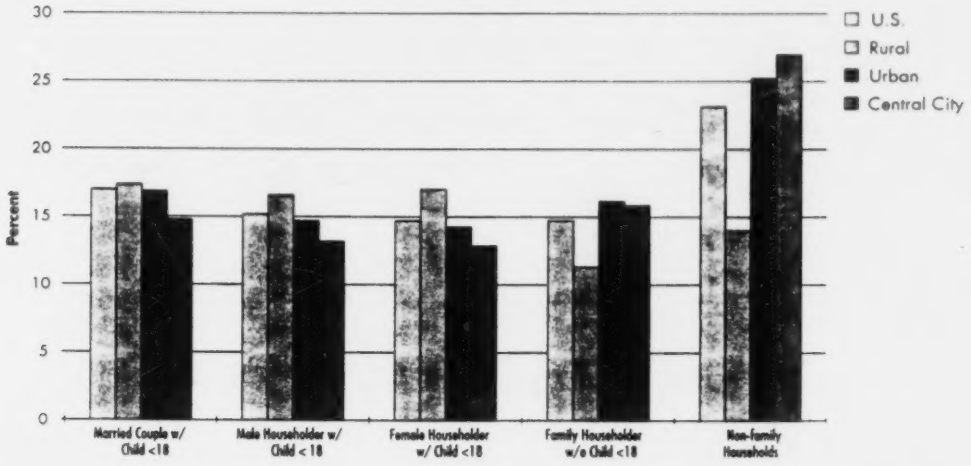
	U.S.	Rural	Urban	Central City
Married Couple w/ Child <18	27.7	23.9	29.3	23.8
Male Householder w/ Child <18	13.5	8.7	15.2	11.1
Female Householder w/ Child <18	10.6	11.0	10.5	8.4
Family Householder w/o Child <18	21.5	17.4	23.1	21.5
Non-family Households	18.2	10.7	19.9	21.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-10:

Percent of U.S. Persons Using the Internet Outside the Home

By Household Type
By U.S., Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
Married Couple w/ Child <18	17.0	17.4	16.9	14.8
Male Householder w/ Child < 18	15.2	16.6	14.7	13.2
Female Householder w/ Child <18	14.7	17.0	14.3	12.9
Family Householder w/o Child <18	14.8	11.3	16.1	15.8
Non-family Households	23.1	14.0	25.2	27.0

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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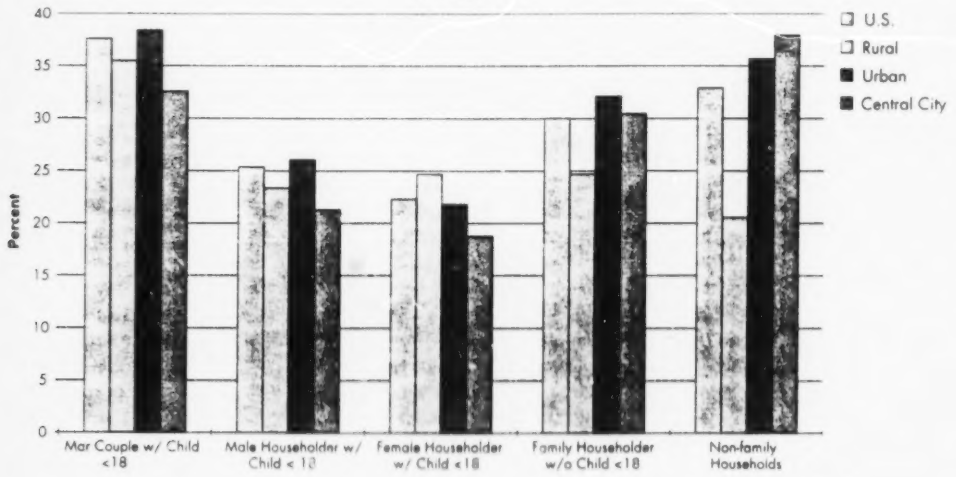
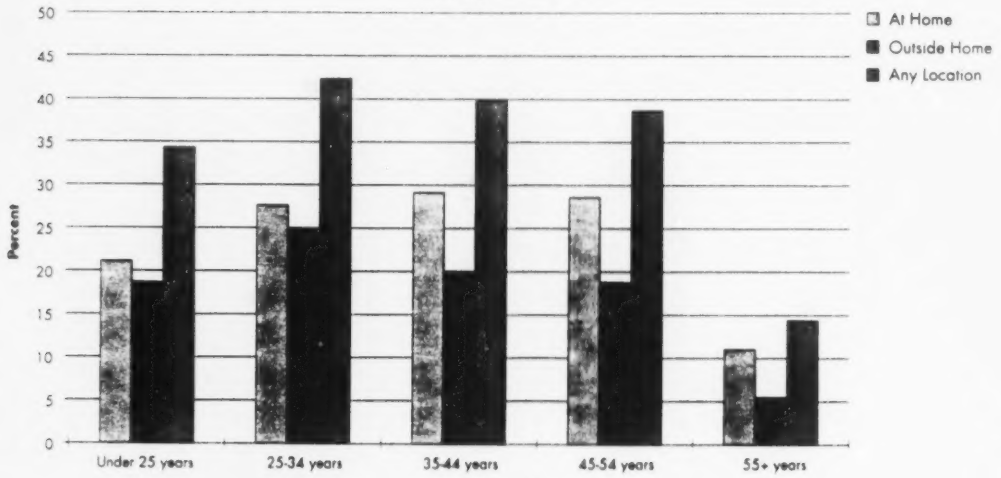
Chart II-11: **Percent of U.S. Persons Using the Internet From Any Location**
By Household Type
By U.S., Rural, Urban, and Central City Areas
1998



	U.S.	Rural	Urban	Central City
Married Couple w/ Children <18	37.6	35.5	38.4	32.6
Male Householder w/ Children < 18	25.4	23.4	26.1	21.3
Female Householder w/ Children <18	22.3	24.7	21.8	18.8
Family Householder w/o Children <18	30.0	24.7	32.1	30.5
Non-family Households	32.9	20.6	35.7	37.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-12: **Percent of U.S. Persons Using the Internet**
By Age
By Location
1998



	At Home	Outside Home	Any Location
Under 25 years	21.1	18.7	34.3
25-34 years	27.6	24.7	42.3
35-44 years	29.2	20.0	39.8
45-54 years	28.6	18.8	38.7
55+ years	11.0	5.5	14.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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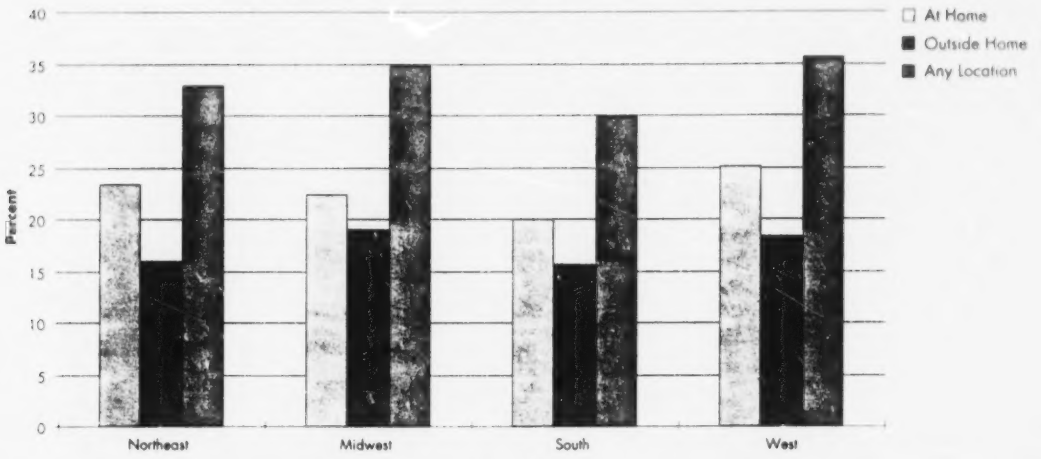
Chart II-13:

Percent of U.S. Persons Using the Internet

By Region
By Location
1998



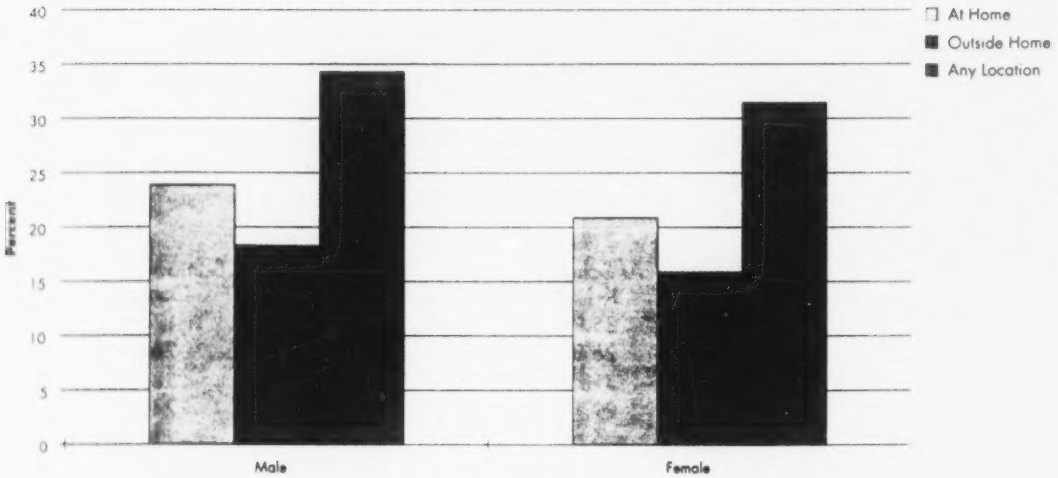
	At Home	Outside Home	Any Location
Northeast	23.3	15.9	32.9
Midwest	22.4	18.9	34.7
South	20.0	15.6	29.8
West	25.1	18.3	35.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-14:

Percent of U.S. Persons Using the Internet

By Gender
By Location
1998



	At Home	Outside Home	Any Location
Male	23.9	18.3	34.3
Female	20.9	15.9	31.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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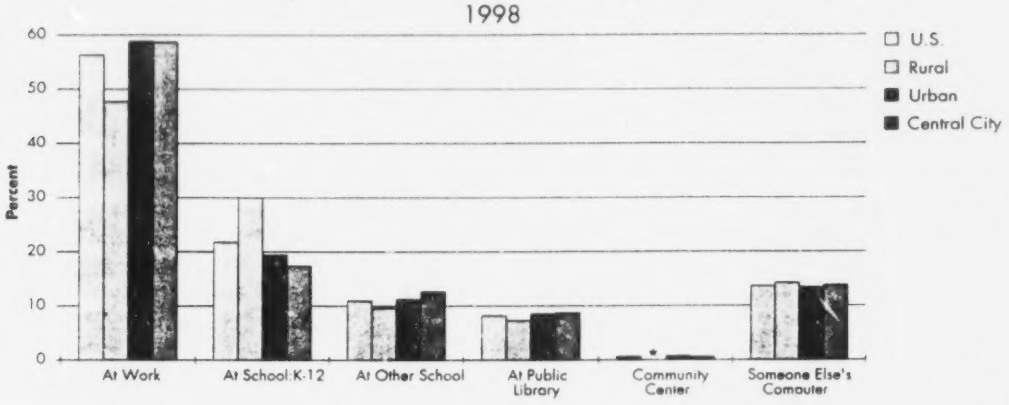
Chart II-15: Percent of U.S. Persons Using the Internet Outside the Home

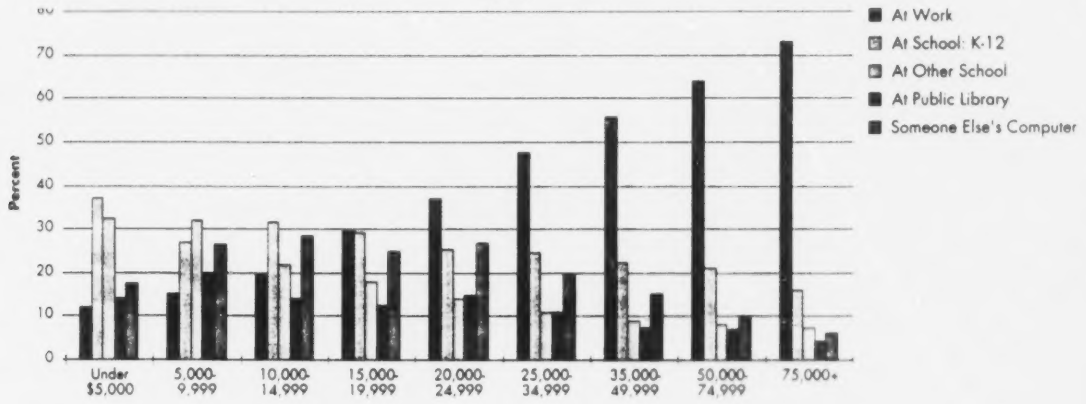
By Selected Places
By U.S., Rural, Urban, Central City Areas
1998



	U.S.	Rural	Urban	Central City
At Work	56.3	47.7	58.8	58.7
At School:K-12	21.8	30.0	19.4	17.4
At Other School	10.9	9.6	11.2	12.6
At Public Library	8.2	7.3	8.5	8.7
Community Center	0.6	0.3*	0.7	0.6
Someone Else's Computer	13.6	14.2	13.4	13.8

Chart II-16: Percent of U.S. Persons Using the Internet Outside the Home

By Selected Places
By Income
1998



	At Work	At School: K-12	At Other School	At Public Library	Someone Else's Computer
Under $5,000	12.3	36.9	32.4	14.2	17.7
5,000-9,999	15.2	26.8	32.0	19.9	26.6
10,000-14,999	19.8	31.7	21.7	13.9	28.4
15,000-19,999	30.0	29.1	18.0	12.3	24.9
20,000-24,999	37.1	25.6	14.1	14.9	27.1
25,000-34,999	47.8	24.7	11.1	11.0	20.0
35,000-49,999	55.7	22.2	8.9	7.5	15.1
50,000-74,999	64.1	21.2	8.1	7.0	10.2
75,000+	72.9	16.2	7.6	4.2	6.2

* Statistically not significant
NOTE: Source data applies to all charts & tables on this page.
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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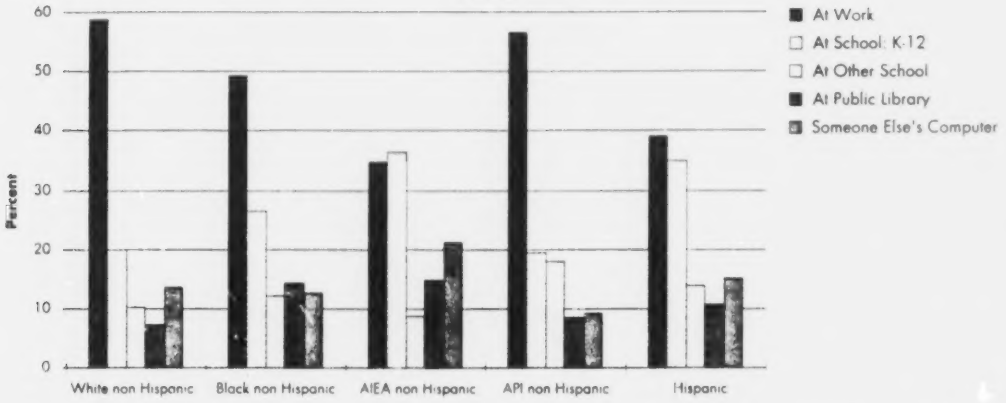
Chart II-17: Percent of U.S. Persons Using the Internet Outside the Home

By Selected Places
By Race/Origin

1998



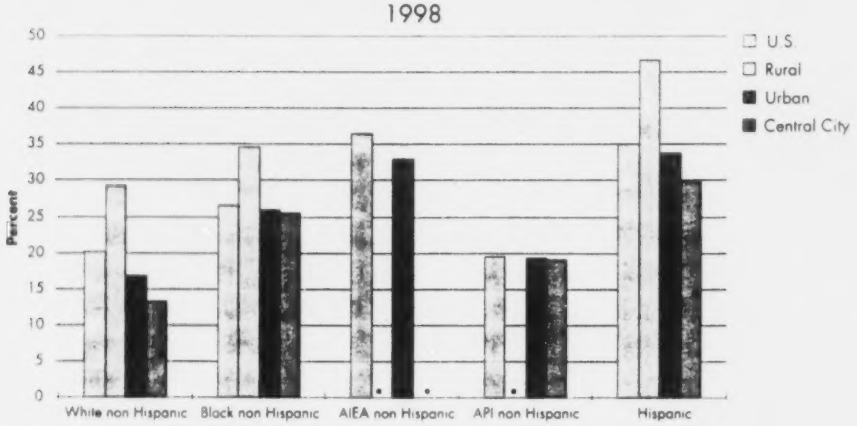
	At Work	At School: K-12	At Other School	At Public Library	Someone Else's Computer
White non Hispanic	58.8	20.0	10.1	7.2	13.7
Black non Hispanic	49.3	26.6	12.2	14.4	12.6
AIEA non Hispanic	34.8	36.5	8.9	14.7	21.1
API non Hispanic	56.6	19.4	18.1	8.6	9.3
Hispanic	39.1	35.1	13.9	10.6	15.2

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-18: Percent of U.S. Persons Using the Internet Outside the Home Who Gain Access at Schools K-12

By Race/Origin
By U.S., Rural, Urban, Central City Areas

1998



	U.S.	Rural	Urban	Central City
White non Hispanic	20.0	29.2	16.8	13.3
Black non Hispanic	26.6	34.6	25.9	25.5
AIEA non Hispanic	36.5	45.8*	33.0	29.3*
API non Hispanic	19.4	25.5*	19.2	19.1
Hispanic	35.1	46.6	33.9	29.9

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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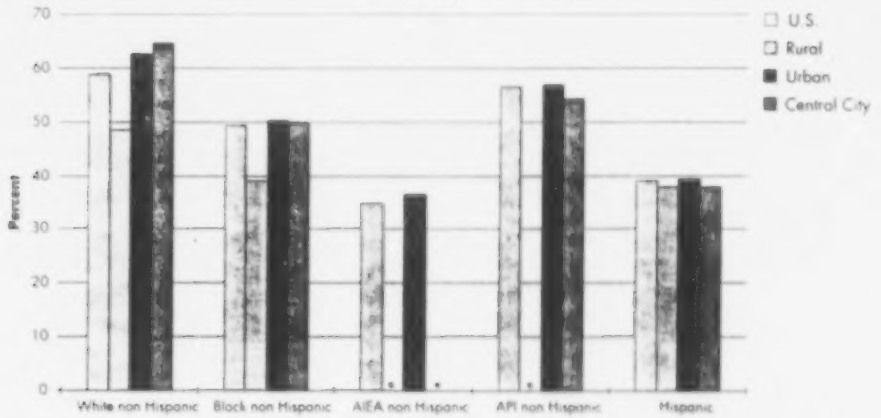
Chart II-19: **Percent of U.S. Persons Using the Internet Outside the Home Who Access the Internet at Work**

By Race/Origin
By U.S., Rural, Urban, Central City Areas

1998



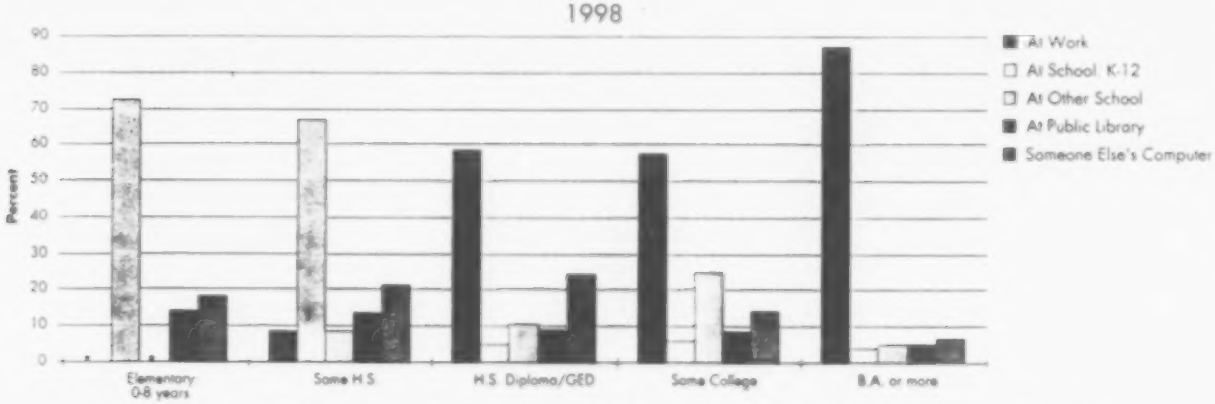
	U.S.	Rural	Urban	Central City
White non Hispanic	58.8	48.5	62.5	64.6
Black non Hispanic	49.3	39.0	50.2	49.8
AIEA non Hispanic	34.8	30.6*	36.4	41.1*
API non Hispanic	56.6	52.2*	56.8	54.2
Hispanic	39.1	36.8	39.3	38.0

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys

Chart II-20: **Percent of U.S. Persons Using the Internet Outside the Home**

By Selected Places
By Education

1998



	At Work	At Schools: K-12	At Other Schools	At Public Library	Someone Else's Computer
Elementary: 0-8 years	6.0*	72.4	1.9*	14.1	18.4
Some H.S.	8.7	66.8	8.5	13.9	21.4
H.S. Diploma/GED	58.8	5.3	10.4	8.9	24.1
Some College	57.4	6.2	24.8	8.7	14.0
B.A. or more	87.2	4.0	5.3	4.9	6.8

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys

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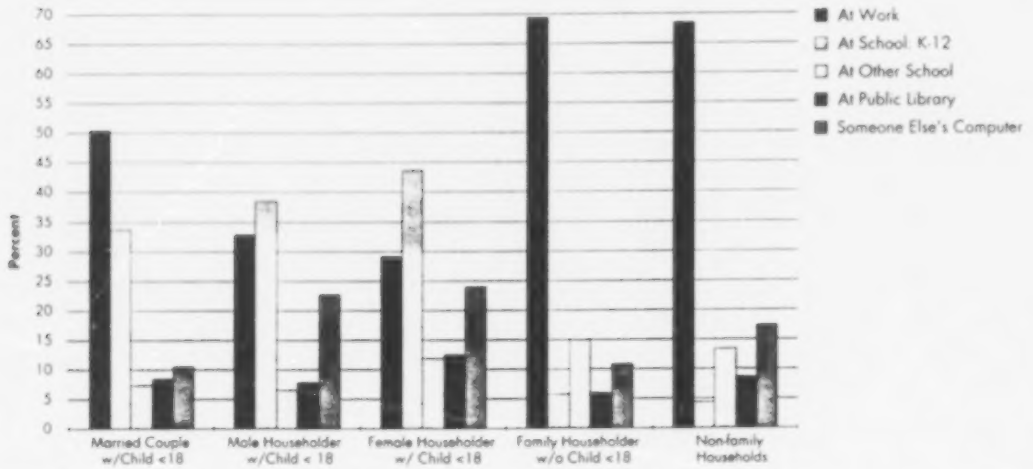
Chart II-21: Percent of U.S. Persons Using the Internet Outside the Home

By Household Type

1998



	At Work	At School: K-12	At Other School	At Public Library	Someone Else's Computer
Married Couple w/ Child <18	50.4	33.7	7.3	8.4	10.5
Male Householder w/ Child < 18	32.8	38.5	6.6	7.8	22.6
Female Householder w/ Child <18	29.0	43.6	11.8	12.5	23.8
Family Householder w/o Child <18	69.4	5.8	15.0	6.0	10.7
Non-family Households	68.4	4.3	13.4	8.6	17.3

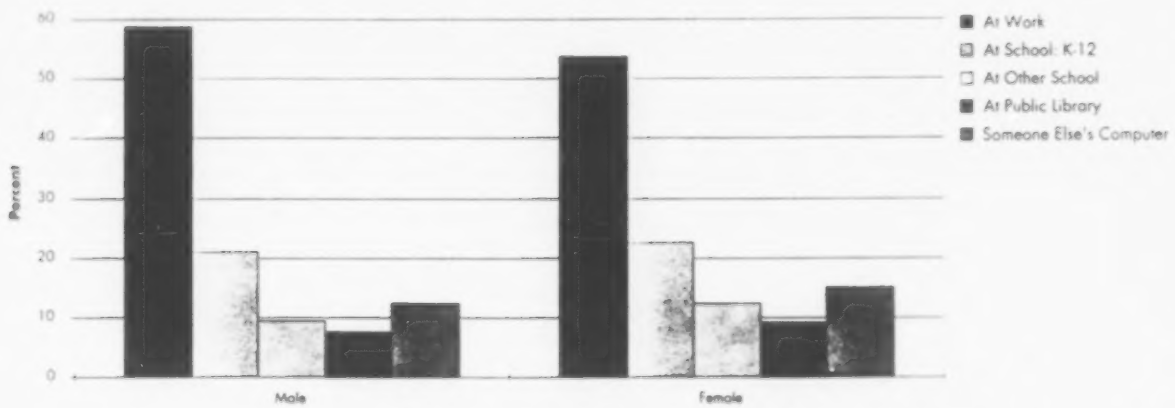
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys

Chart II-22: Percent of U.S. Persons Using the Internet Outside the Home

By Selected Places

By Gender

1998



	At Work	At School: K-12	At Other School	At Public Library	Someone Else's Computer
Male	58.7	21.0	9.5	7.5	12.4
Female	53.8	22.6	12.4	9.1	14.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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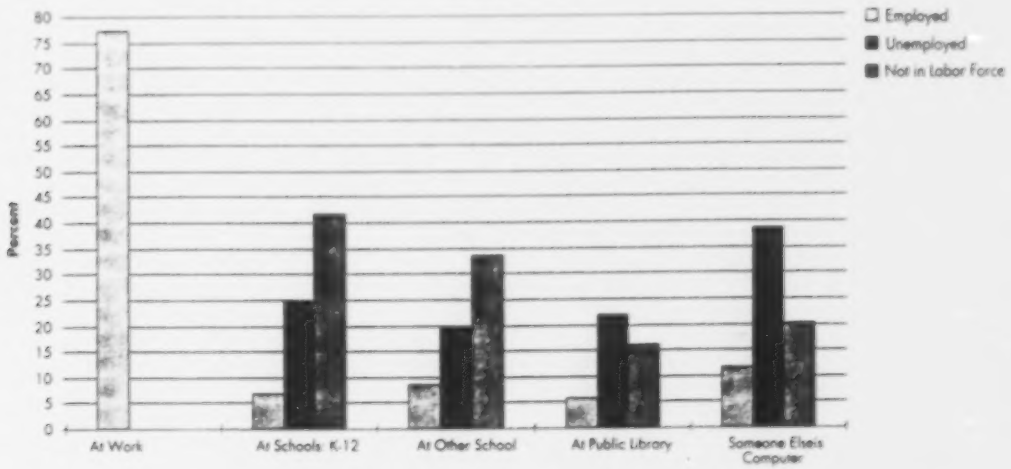
Chart II-23: Percent of U.S. Persons Using the Internet Outside the Home

By Employment

1998



	At Work	At School: K-12	At Other School	At Public Library	Someone Else's Computer
Employed	77.2	6.9	8.4	5.9	11.5
Unemployed	0.0	25.0	19.5	21.9	38.8
Not in Labor Force	0.0	41.7	33.6	16.1	20.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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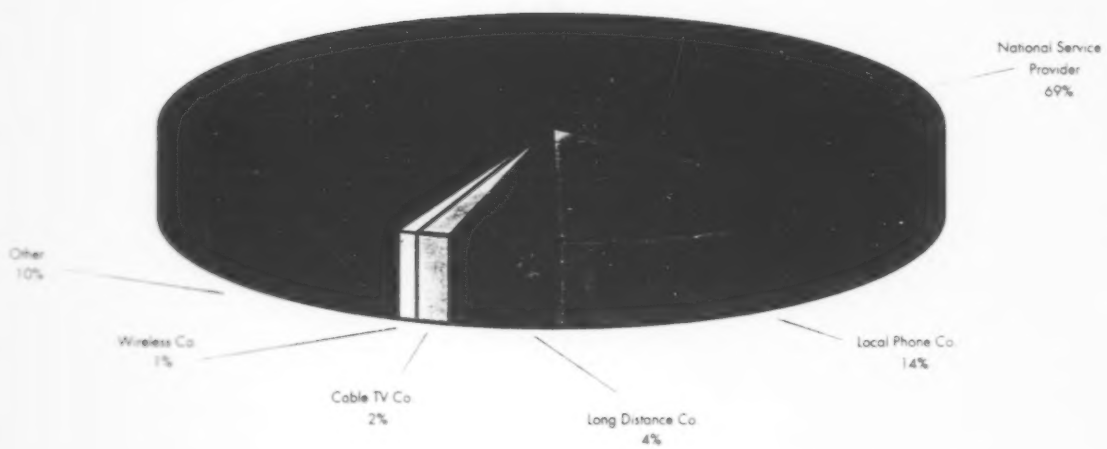
Chart II-24a: **Percent of U.S. Households with a Computer/WebTV®**
Accessing the Internet At Home

1998

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-24b: **Percent of U.S. Households with Internet Service**
By Type of Internet Service Providers

1998



Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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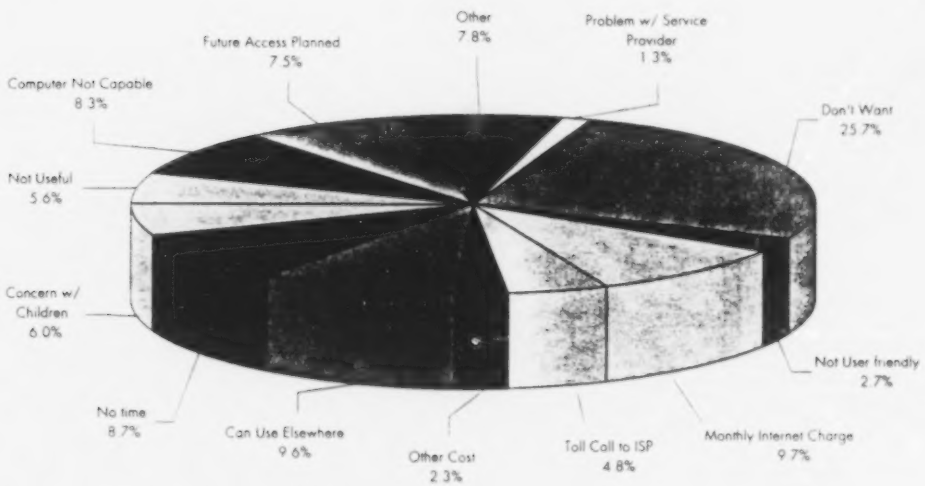
Chart II-25

Reasons for Households with a Computer/WebTV* Not Using the Internet at Home

U.S. Households

1998



Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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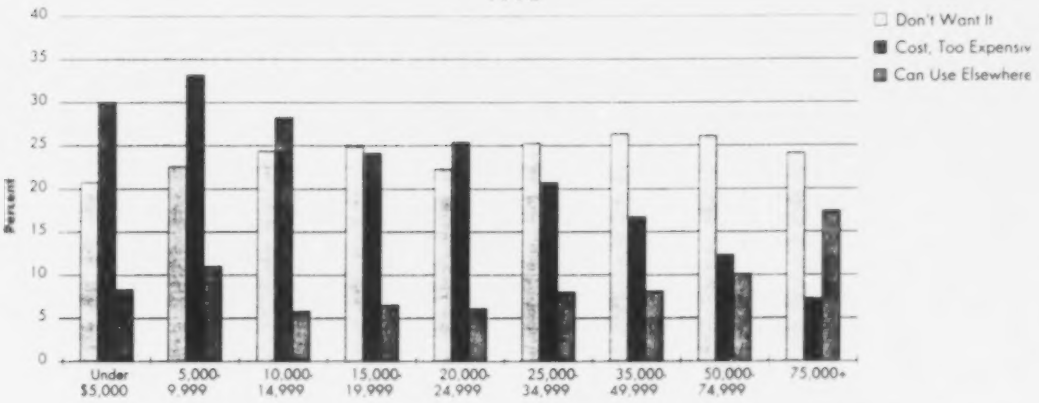
Chart II-26:

Reasons for Households with a Computer/WebTV* Not Using the Internet at Home

By Income

1998



	Don't Want It	Cost, Too Expensive	Can Use Elsewhere
Under $5,000	20.8	30.0	8.3
5,000 to 9,999	22.6	33.2	11.0
10,000 to 14,999	24.4	28.2	5.8
15,000 to 19,999	24.9	24.1	6.5
20,000 to 24,999	22.3	25.4	6.1
25,000 to 34,999	25.3	20.7	8.0
35,000 to 49,999	26.4	16.7	8.1
50,000 to 74,999	26.1	12.3	10.1
75,000+	24.1	7.2	17.4

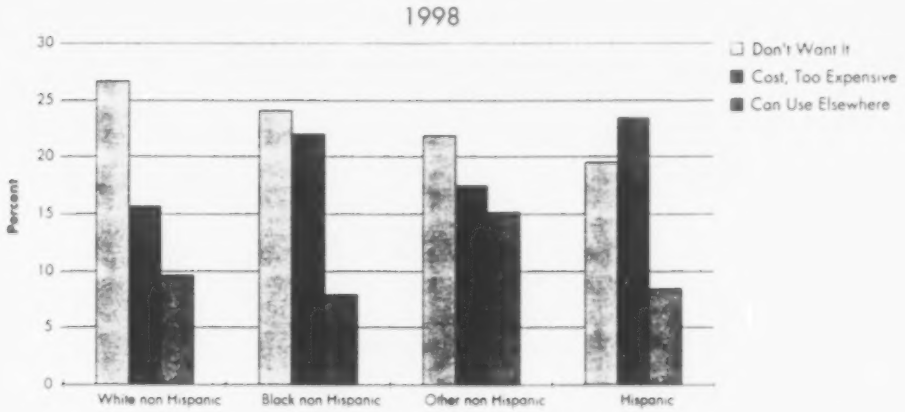
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys

Chart II-27:

Reasons for Households with a Computer/WebTV* Not Using the Internet at Home

By Race/Origin

1998



	Don't Want It	Cost, Too Expensive	Can Use Elsewhere
White non Hispanic	26.7	15.6	9.6
Black non Hispanic	24.0	22.0	7.9
Other non Hispanic	21.8	17.4	15.1
Hispanic	19.6	23.4	8.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys

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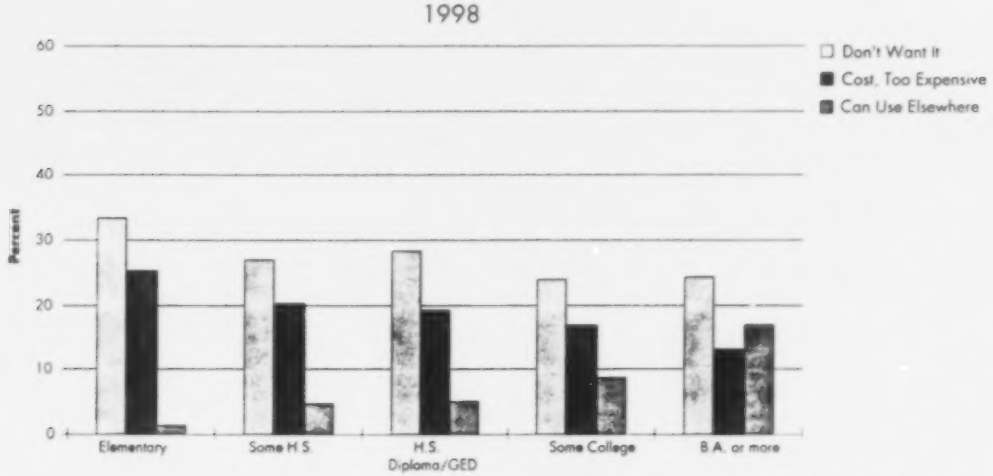
Chart II-28:

Reasons for Households with a Computer/WebTV® Not Using the Internet at Home

By Education

1998



	Don't Want It	Cost, Too Expensive	Can Use Elsewhere
Elementary	33.3	25.3	1.3
Some H.S.	26.8	20.2	4.7
H.S. Diploma/GED	28.2	19.1	5.2
Some College	24.0	16.8	8.7
B.A. or more	24.2	13.2	16.7

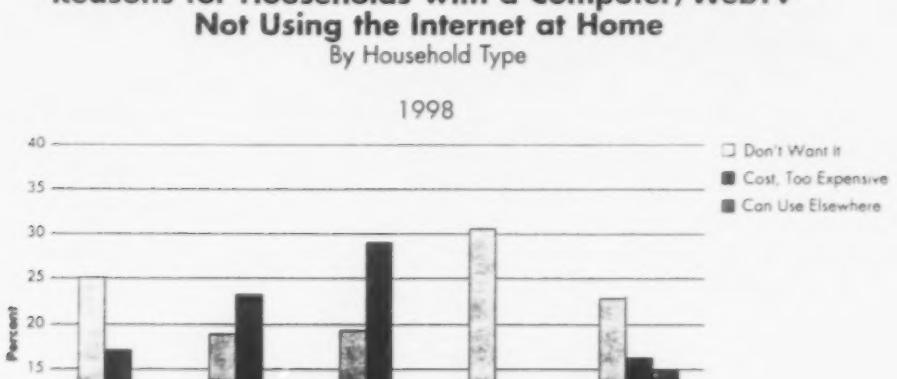
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-29:

Reasons for Households with a Computer/WebTV® Not Using the Internet at Home

By Household Type

1998



	Don't Want It	Cost, Too Expensive	Can Use Elsewhere
Married Couple w/ Child <18	24.9	16.9	7.6
Male Householder w/ Child < 18	18.7	23.2	8.3
Female Householder w/ Child <18	19.4	29.4	6.2
Family Households w/o Child <18	30.9	12.7	9.9
Non-family Households	22.8	16.3	15.1

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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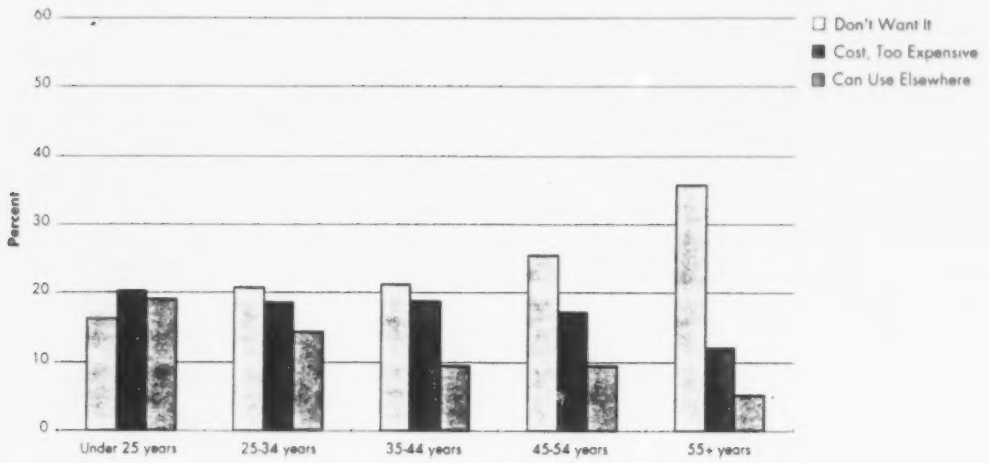
Chart II-30:

Reasons for Households with Computer/WebTV® Not Using the Internet at Home

By Age

1998



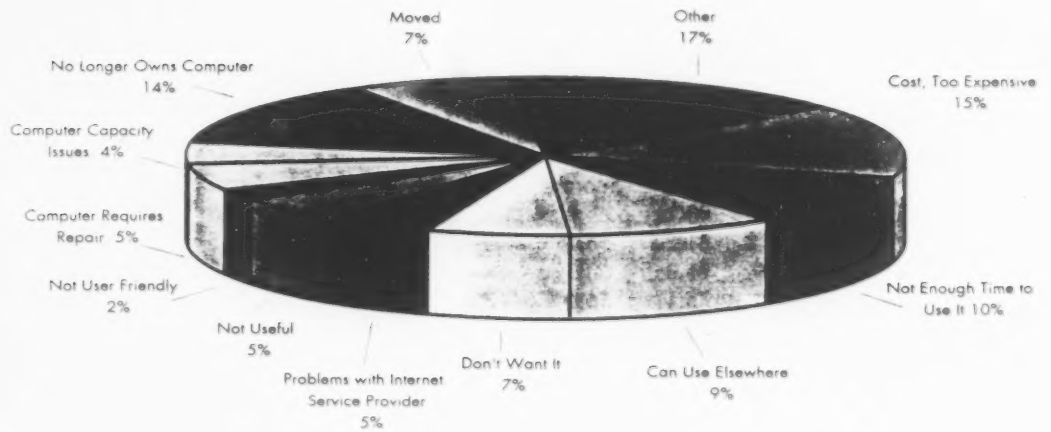
	Don't Want It	Cost, Too Expensive	Can Use Elsewhere
Under 25 years	16.4	20.4	19.1
25-34 years	20.9	18.7	14.3
35-44 years	21.2	19.0	9.4
45-54 years	25.6	17.3	9.5
55+ years	35.7	12.1	5.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-31:

Reasons for U.S. Households Discontinuing Internet Use

1998


Moved 7%
Other 17%
No Longer Owns Computer 14%
Cost, Too Expensive 15%
Computer Capacity Issues 4%
Computer Requires Repair 5%
Not User Friendly 2%
Not Enough Time to Use It 10%
Not Useful 5%
Problems with Internet Service Provider 5%
Don't Want It 7%
Can Use Elsewhere 9%

Source: National Telecommunications and Information Administration and U.S. Census Bureau, U.S. Department of Commerce, December 1998 Current Population Surveys.

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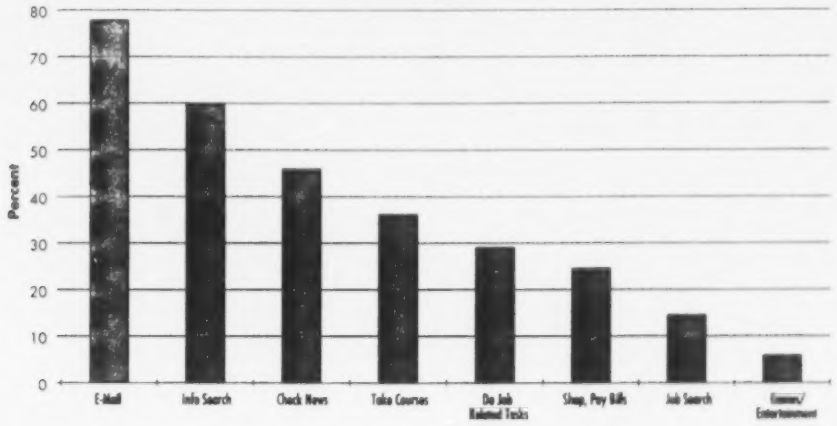
Chart II-32:

Percent of U.S. Persons Using the Internet At Home

By Type of Use

1998



	E-Mail	Info Search	Check News	Take Courses	Do Job Related Tasks	Shop, Pay Bills	Job Search	Games/ Entertainment
U.S. Persons	77.9	59.8	45.9	36.1	29.1	24.5	14.5	5.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

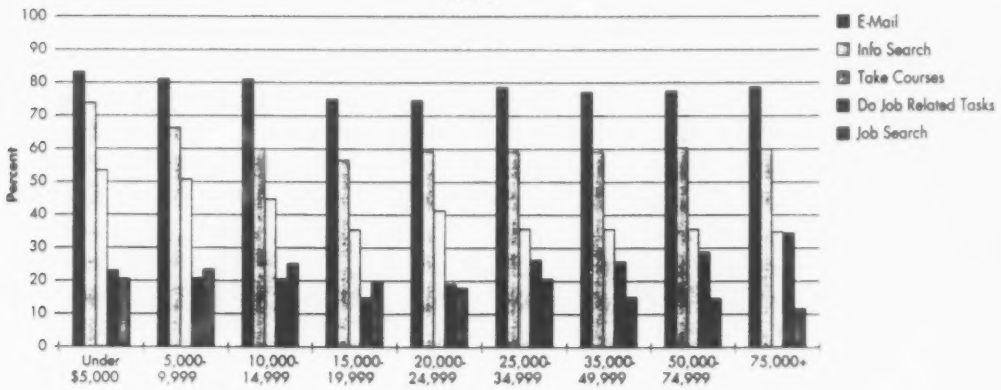
Chart II-33:

Percent of U.S. Persons Using the Internet At Home

By Income

By Type of Use

1998



	E-Mail	Info Search	Take Courses	Related Tasks	Job Search
Under $5,000	83.1	73.8	53.5	23.0*	20.6*
5,000-9,999	81.2	66.3	50.8	20.9*	23.5
10,000-14,999	81.0	60.0	44.8	20.6	25.3
15,000-19,999	75.1	56.6	35.6	15.1	20.0
20,000-24,999	74.6	59.2	41.4	19.1	17.9
25,000-34,999	78.7	59.1	35.9	26.4	20.7
35,000-49,999	77.2	59.1	35.8	25.9	15.2
50,000-74,999	77.5	60.3	35.8	28.9	14.8
75,000+	78.7	60.0	35.0	34.5	11.7

* Statistically not significant

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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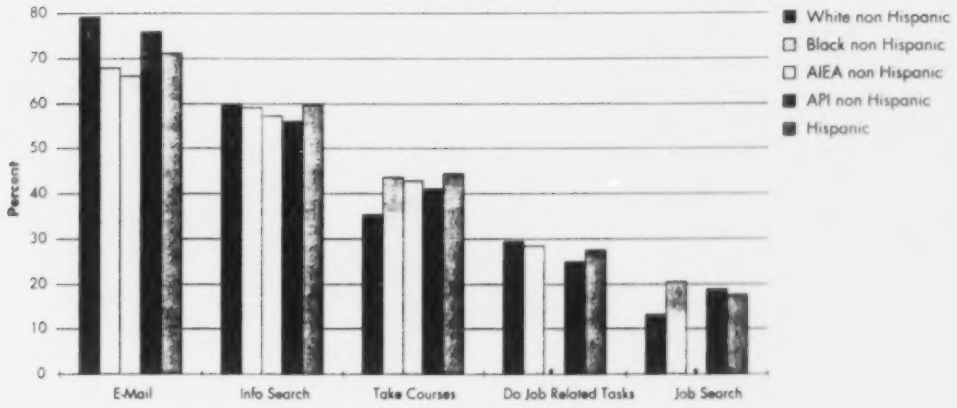
Chart II-34:

Percent of U.S. Persons Using the Internet At Home

By Race/Origin
By Type of Use
1998



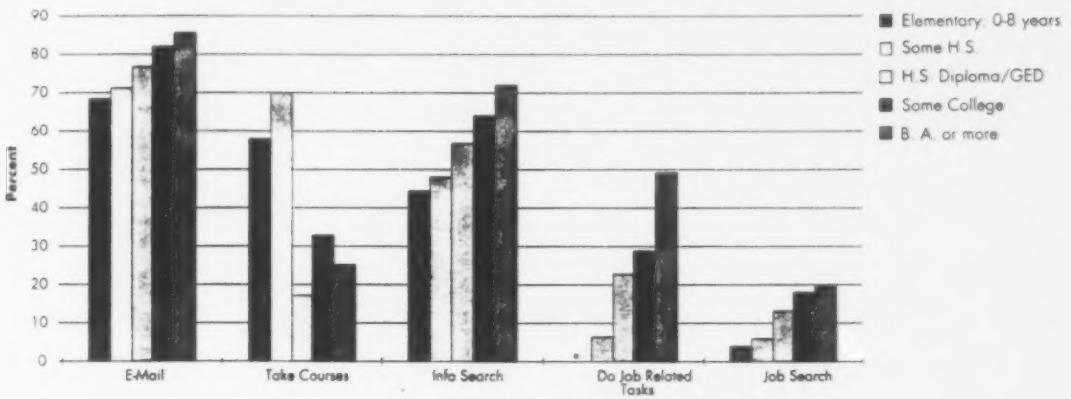
	E-Mail	Info Search	Take Courses	Related Tasks	Job Search
White non Hispanic	79.0	60.0	35.0	29.5	13.8
Black non Hispanic	68.2	59.3	43.4	28.2	20.3
AIEA non Hispanic	66.3	57.0	43.0	26.4*	16.1*
API non Hispanic	76.1	55.9	40.3	25.0	18.7
Hispanic	71.5	60.0	44.1	27.6	17.6

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-35:

Percent of U.S. Persons Using the Internet At Home

By Education
By Type of Use
1998



	E-Mail	Take Courses	Info Search	Related Tasks	Job Search
Elementary: 0-8 years	68.6	58.1	44.3	3.8*	4.1*
Some H.S.	71.4	70.0	48.1	6.5	6.0
H.S. Diploma/GED	76.7	17.2	57.0	22.7	13.4
Some College	81.9	32.8	64.2	28.6	17.9
B.A. or more	85.7	25.1	72.1	49.3	20.1

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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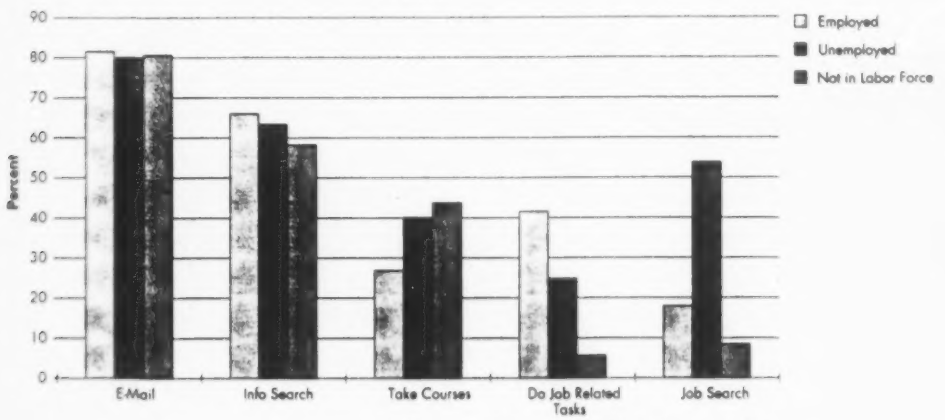
Chart II-36: **Percent of U.S. Persons Using the Internet at Home**

By Type of Use
By Employment
1998



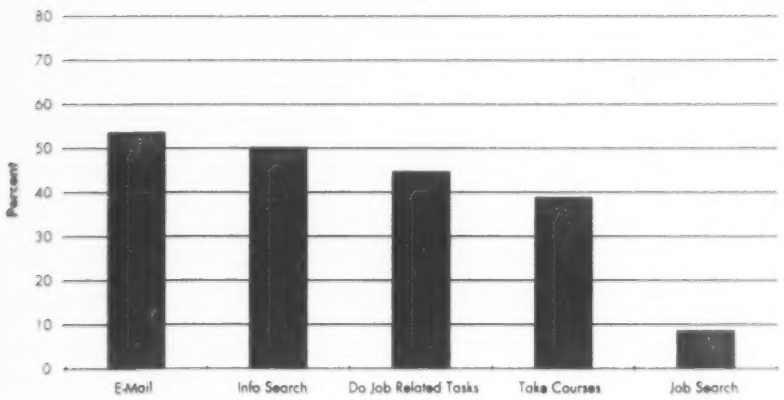
	E-Mail	Info Search	Take Courses	Related Tasks	Job Search
Employed	81.5	66.0	26.9	41.6	18.0
Unemployed	79.9	63.4	40.1	24.9	53.9
Not in Labor Force	80.6	58.3	43.7	5.7	8.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-37: **Percent of U.S. Persons Using the Internet Outside the Home**

By Type of Use

1998



	E-Mail	Info Search	Related Tasks	Take Courses	Job Search
U.S. Persons	53.6	50.2	44.6	38.8	8.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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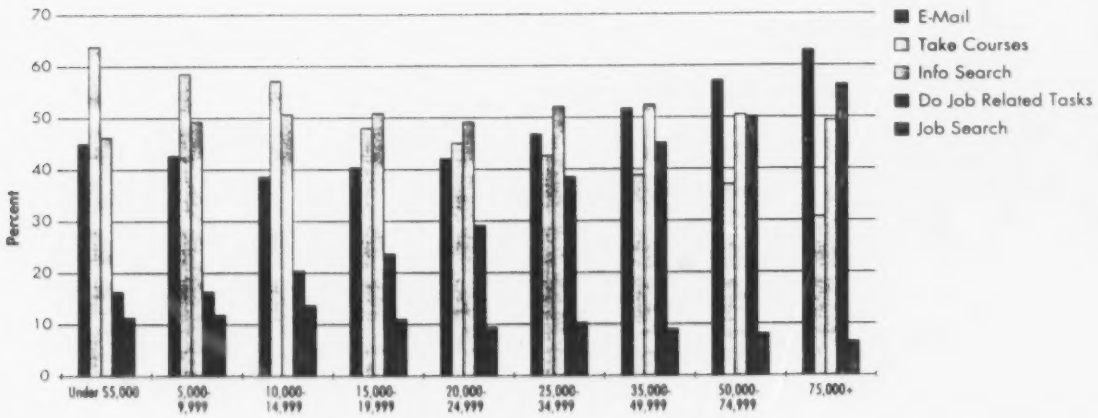
Chart II-38: **Percent of U.S. Persons Using the Internet Outside the Home**
By Type of Use
By Income
1998



	E-Mail	Take Courses	Info Search	Related Tasks	Job Search
Under $5,000	45.0	63.8	46.2	16.3	11.3
5,000-9,999	42.7	58.5	49.3	16.3	11.8
10,000-14,999	38.6	57.1	50.7	20.4	13.7
15,000-19,999	40.4	48.0	50.9	23.6	11.0
20,000-24,999	42.1	45.1	49.2	29.1	9.4
25,000-34,999	46.8	42.6	52.1	38.5	10.3
35,000-49,999	51.7	38.8	52.4	45.1	9.0
50,000-74,999	57.1	37.0	50.5	50.1	8.1
75,000+	62.9	30.7	49.4	56.3	6.6

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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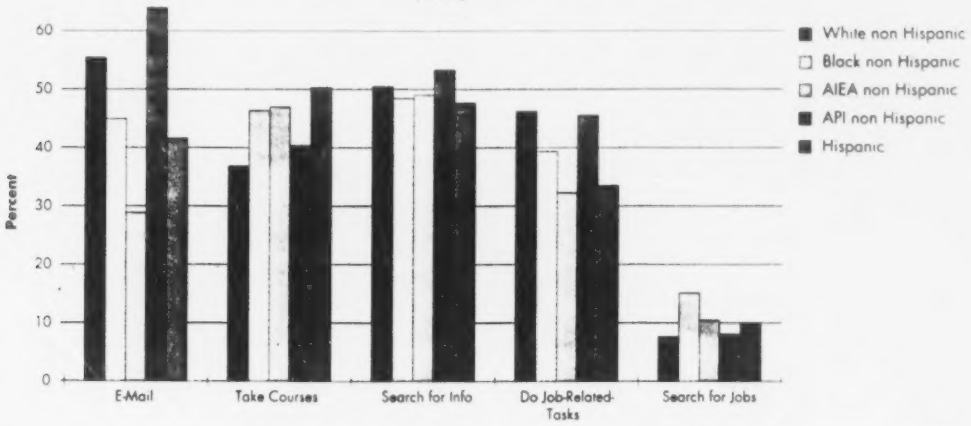
Chart II-39: Percent of U.S. Persons Using the Internet Outside the Home

By Type of Use
By Race/Origin
1998

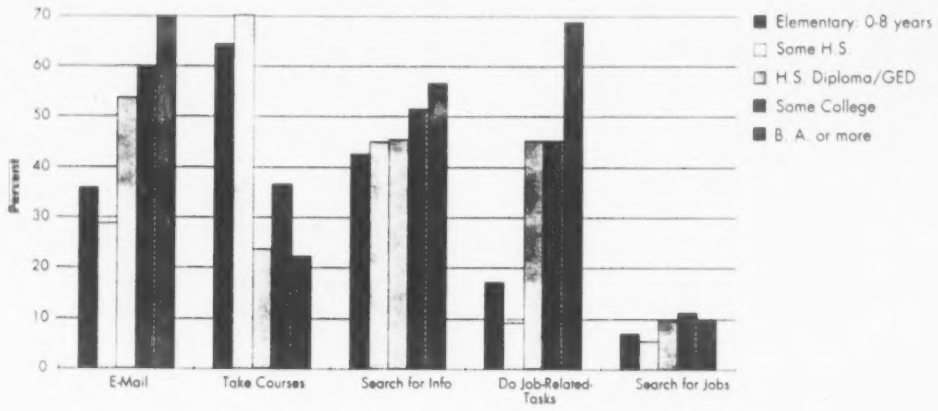


	E-Mail	Take Courses	Info Search	Related Tasks	Job Search
White non Hispanic	55.3	36.8	50.4	46.2	7.7
Black non Hispanic	44.9	46.3	48.4	39.4	15.1
AIEA non Hispanic	28.9	47.0	49.1	32.3	10.5
API non Hispanic	64.0	40.4	53.3	45.5	8.0
Hispanic	41.6	50.3	47.6	33.6	9.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-40: Percent of U.S. Persons Using the Internet Outside the Home

By Type of Use
By Education
1998



	E-Mail	Take Courses	Info Search	Related Tasks	Job Search
Elementary	35.8	64.4	42.6	17.2	6.9
Some H.S.	28.7	70.2	45.0	9.2	5.6
H.S. Diploma/GED	53.7	23.7	45.5	45.2	9.6
Some College	59.8	36.6	51.5	45.2	11.2
B.A. or more	69.9	22.2	56.7	68.7	9.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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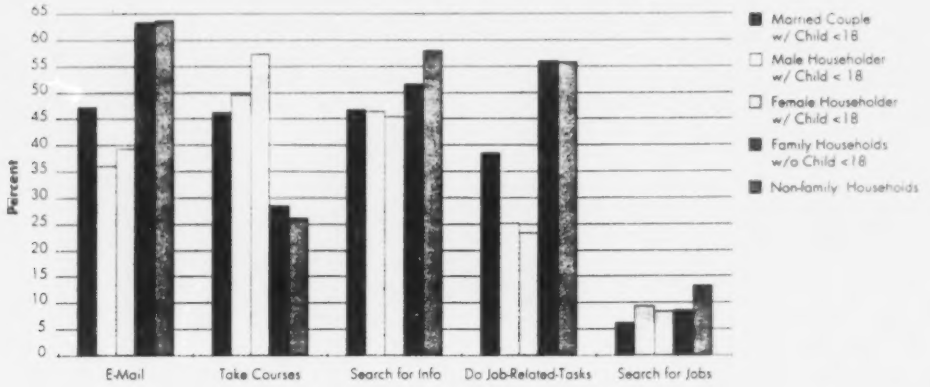
Chart II-41 **Percent of U.S. Persons Using the Internet Outside the Home**

By Type of Use
By Household Type
1998

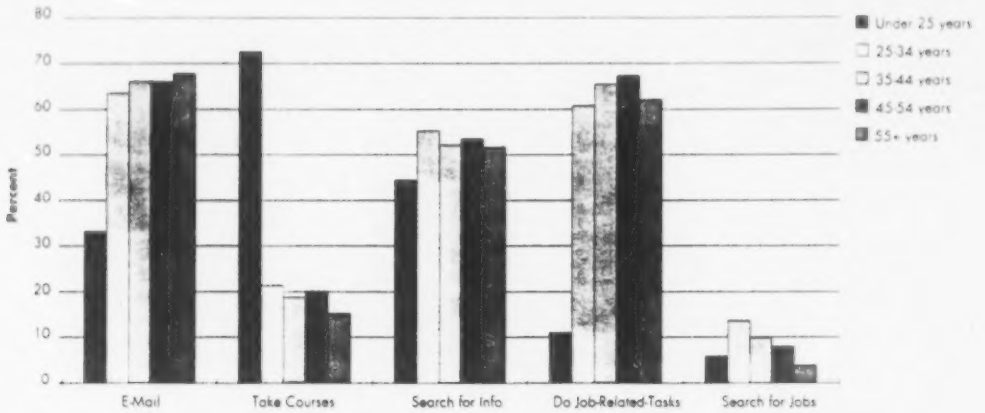


	E-Mail	Take Courses	Info Search	Related Tasks	Job Search
Married Couple w/ Child <18	47.3	46.2	46.7	38.5	6.1
Male Householder w/ Child < 18	36.1	49.6	46.4	25.2	9.4
Female Householder w/ Child <18	39.3	57.3	45.5	23.3	8.3
Family Households w/o Child <18	63.4	28.6	51.5	55.9	8.5
Non-family Households	63.6	26.2	57.9	55.9	13.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-42: **Percent of U.S. Persons Using the Internet Outside the Home**

By Type of Use
By Age
1998



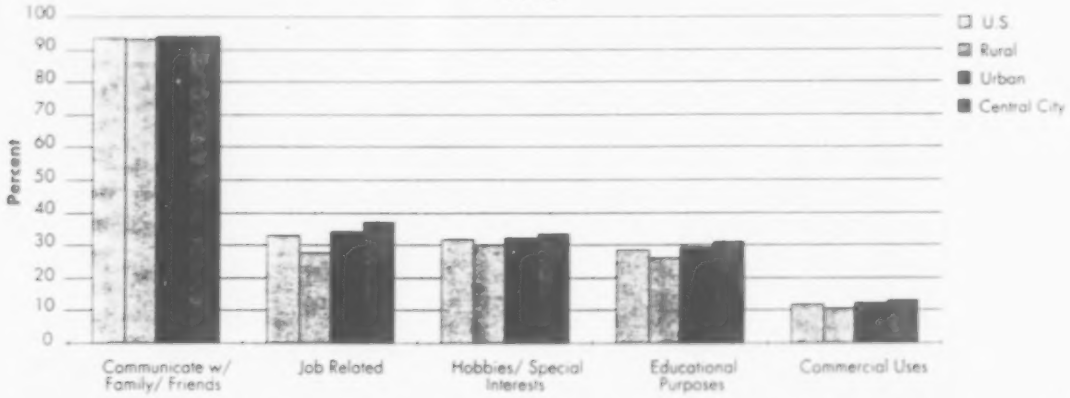
	E-Mail	Take Courses	Info Search	Related Tasks	Job Search
Under 25 years	33.1	72.5	44.4	11.0	5.9
25-34 years	63.4	21.3	55.2	60.7	13.6
35-44 years	66.0	18.8	52.1	65.4	9.9
45-54 years	66.0	20.0	53.4	67.2	7.9
55+ years	67.7	15.2	51.6	62.0	3.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-43:

Percent of U.S. Persons Using Email at Home

By Subject Matter
By U.S., Rural, Urban, Central City Areas
1998



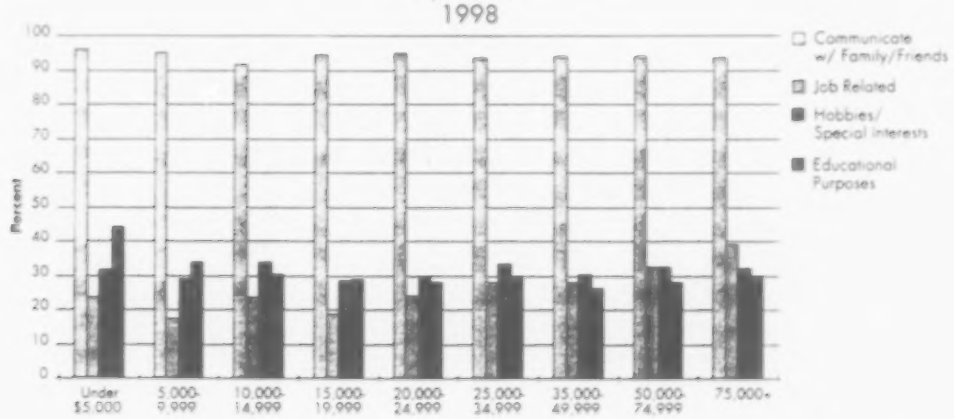
	U.S.	Rural	Urban	Central City
Communicate w/ Family/ Friends	93.6	93.0	93.8	93.7
Job Related	32.8	27.8	34.1	37.0
Hobbies/ Special Interests	31.6	30.0	32.0	33.2
Educational Purposes	28.6	26.0	29.3	30.8
Commercial Uses	11.9	10.7	12.3	13.1

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-44:

Percent of U.S. Persons Using E-Mail at Home

By Subject Matter
By Income
1998



	Communicate w/ Family/ Friends	Job Related	Hobbies/ Special Interests	Educational Purposes
Under $5,000	96.2	23.5	31.6	44.0
5,000-9,999	95.3	17.4	28.8	33.9
10,000-14,999	91.4	23.7	33.8	30.0
15,000-19,999	94.0	18.8	28.5	28.8
20,000-24,999	94.5	24.0	29.2	28.0
25,000-34,999	93.5	28.2	33.1	29.4
35,000-49,999	93.6	27.9	30.4	26.4
50,000-74,999	93.9	32.6	32.4	28.2
75,000+	93.5	39.2	32.1	29.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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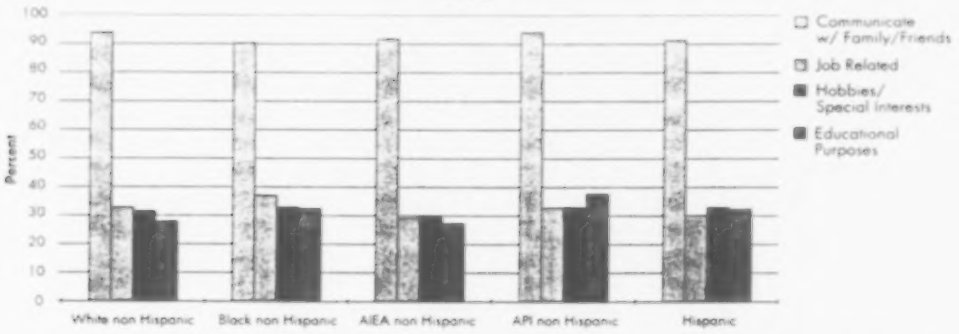
Chart II-45:

Percent of U.S. Persons Using E-Mail at Home

By Subject Matter
By Race/Origin

1998



	Communicate w/ Family/ Friends	Job Related	Hobbies/ Special Interests	Educational Purposes
White non Hispanic	93.9	32.7	31.4	27.8
Black non Hispanic	90.2	37.0	32.8	32.4
AIEA non Hispanic	91.7	29.1	29.5	27.3
API non Hispanic	94.0	32.8	32.9	37.6
Hispanic	91.3	30.1	32.9	32.2

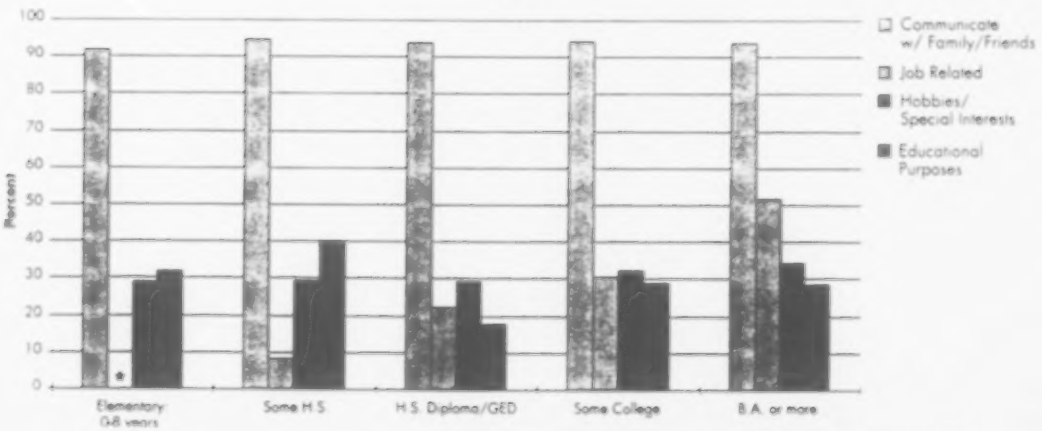
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-46:

Percent of U.S. Persons Using E-Mail at Home

By Subject Matter
By Education

1998



	Communicate w/ Family/ Friends	Job Related	Hobbies/ Special Interests	Educational Purposes
Elementary: 0-8 years	91.8	8.3*	29.1	32.0
Some H.S.	94.8	8.5	29.3	39.6
H.S. Diploma/GED	93.7	22.5	29.2	17.8
Some College	94.1	30.5	32.4	28.9
B.A. or more	93.7	51.7	34.1	28.6

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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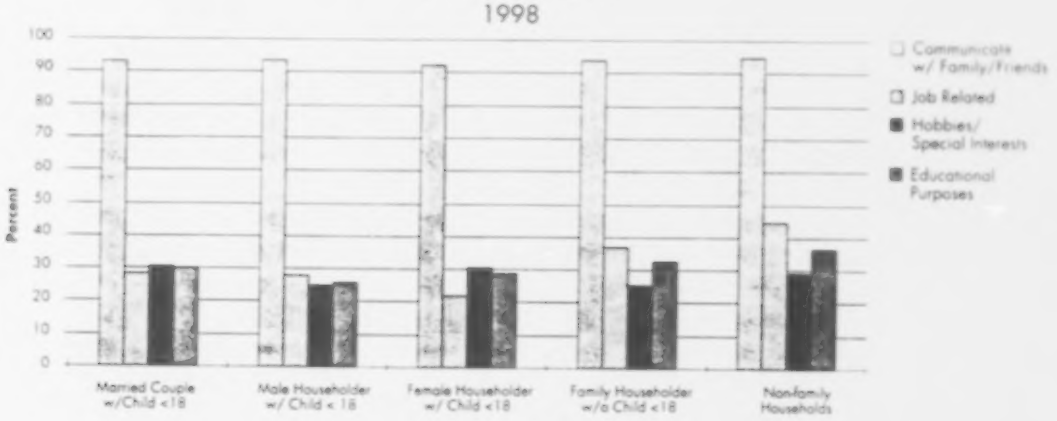
Chart II-47:

Percent of U.S. Persons Using E-Mail at Home

By Subject Matter
By Household Type
1998



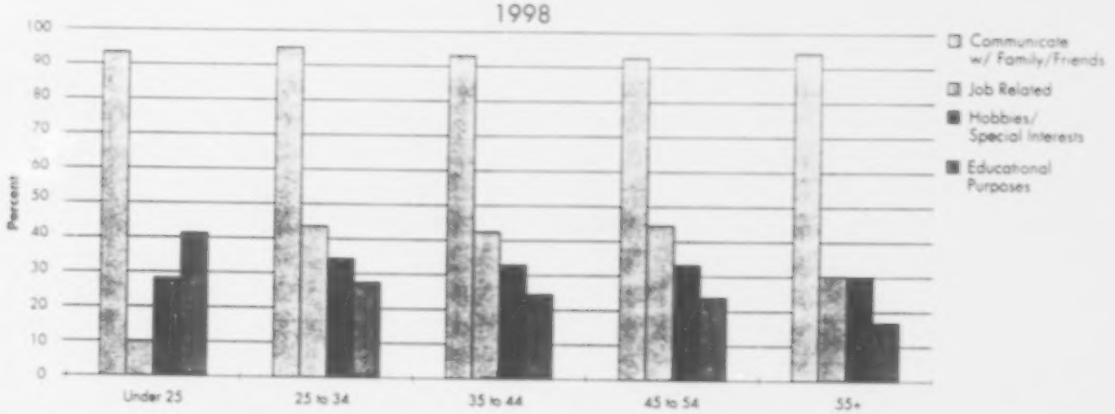
	Communicate w/ Friends/Family	Job Related	Educational Purposes	Hobbies/ Special Interests
Married Couple w/ Child <18	93.1	28.3	30.3	30.0
Male Householder w/ Child < 18	93.4	27.8	24.9	25.6
Female Householder w/ Child <18	92.2	22.0	30.3	28.7
Family Householder w/o Child <18	94.1	36.7	25.5	32.8
Non-family Households	94.7	44.7	29.0	36.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-48:

Percent of U.S. Persons Using E-Mail at Home

By Subject Matter
By Age
1998



	Communicate w/ Family/ Friends	Job Related	Hobbies/ Special Interests	Educational Purposes
Under 25	93.4	10.0	28.2	41.2
25 to 34	95.0	43.5	34.3	27.5
35 to 44	93.0	42.4	32.9	24.4
45 to 54	92.6	44.5	33.2	23.9
55+	94.3	30.1	29.8	16.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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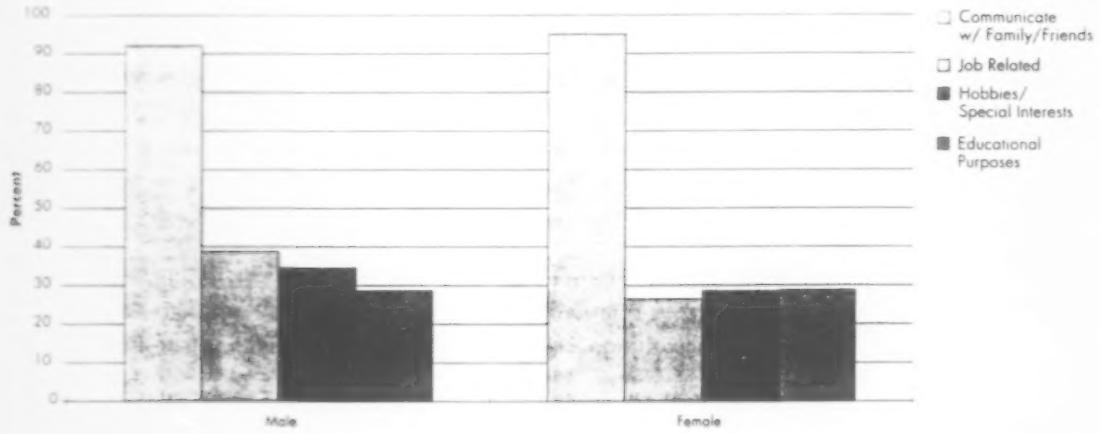
Chart II-49:

Percent of U.S. Persons Using E-mail at Home

By Subject Matter
By Gender
1998



	Communicate w/ Family/ Friends	Job Related	Hobbies/ Special Interests	Educational Purposes
Male	92.1	38.7	34.5	28.6
Female	95.1	26.4	28.5	28.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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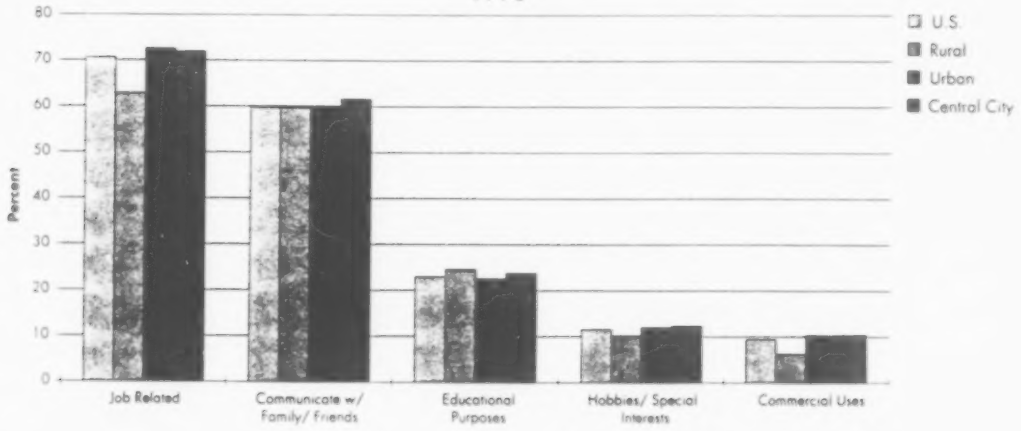
Chart II-50: **Percent of U.S. Persons Using E-Mail Outside the Home**

By Subject Matter

By U.S., Rural, Urban, Central City Areas

1998



	U.S.	Rural	Urban	Central City
Job Related	70.6	62.8	72.5	71.9
Communicate w/ Family/ Friends	59.7	59.7	59.7	61.5
Educational Purposes	22.9	24.5	22.5	23.7
Hobbies/ Special Interests	11.5	10.1	11.9	12.2
Commercial Uses	9.4	6.2	10.2	10.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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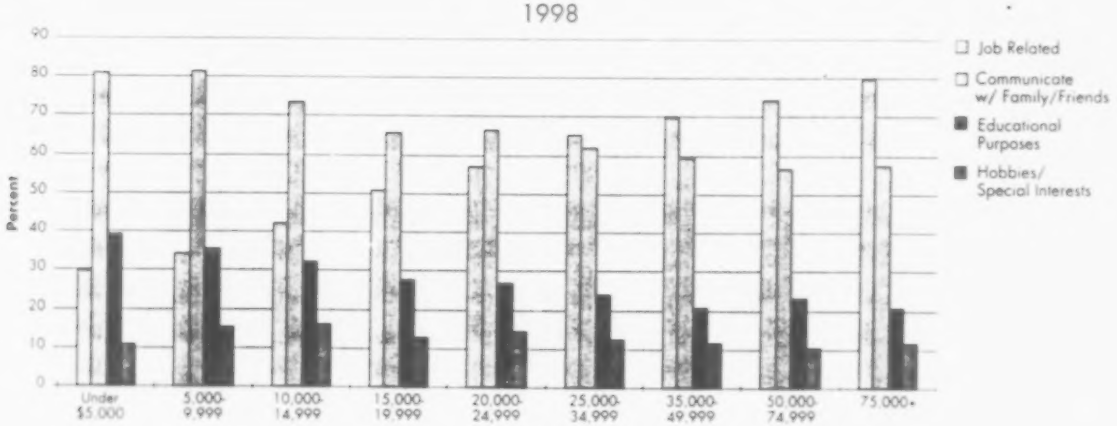
Chart II-51:

Percent of U.S. Persons Using E-Mail Outside the Home

By Subject Matter
By Income

1998



	Job Related	Communicate w/ Family/ Friends	Educational Purposes	Hobbies/ Special Interests
Under $5,000	29.6	80.9	39.2	10.8
5,000-9,999	34.2	81.5	35.6	15.2
10,000-14,999	42.3	73.6	32.1	16.2
15,000-19,999	50.7	65.5	27.7	12.9
20,000-24,999	57.1	66.4	26.8	14.6
25,000-34,999	65.4	61.9	23.9	12.3
35,000-49,999	69.6	59.5	20.6	11.4
50,000-74,999	74.3	56.6	23.0	10.4
75,000+	79.8	57.4	20.8	11.4

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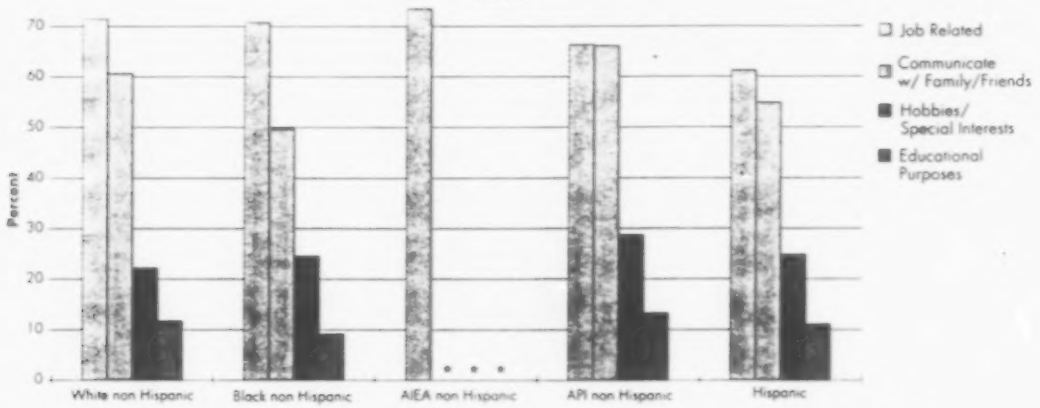
Chart II-52: **Percent of U.S. Persons Using E-Mail Outside the Home**

By Subject Matter
By Race/Origin
1998

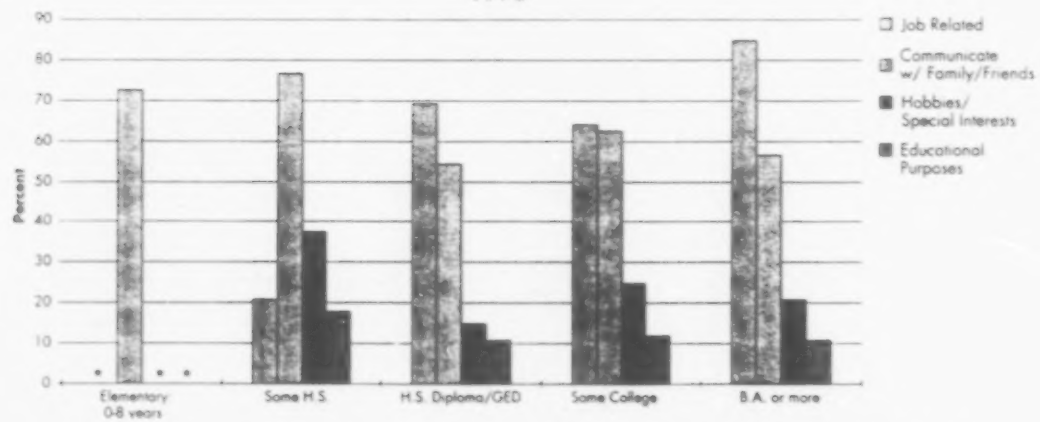


	Job Related	Communicate w/ Family/ Friends	Educational Purposes	Hobbies/ Special Interests
White non Hispanic	71.4	60.6	22.2	11.7
Black non Hispanic	70.8	49.7	24.5	9.1
AIEA non Hispanic	73.5	45.4*	25.7*	5.8*
API non Hispanic	66.3	66.2	28.8	13.3
Hispanic	61.2	54.9	24.8	11.1

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-53: **Percent of U.S. Persons Using E-Mail Outside the Home**

By Subject Matter
By Education
1998



	Job Related	Communicate w/ Family/ Friends	Educational Purposes	Hobbies/ Special Interests
Elementary	24.4*	72.6	30.3*	13.6*
Some H.S.	21.0	76.8	37.6	17.8
H.S. Diploma or GED	69.3	54.2	15.0	10.9
Some College	64.1	62.5	24.9	11.9
B.A. or more	84.9	56.6	20.7	10.8

* Statistically not significant
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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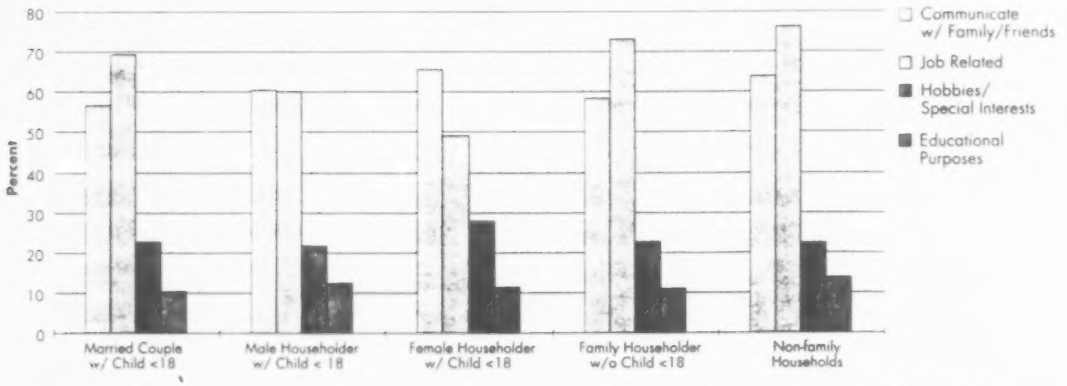
Chart II-54:

Percent of U.S. Persons Using E-Mail Outside the Home

By Subject Matter
By Household Type
1998



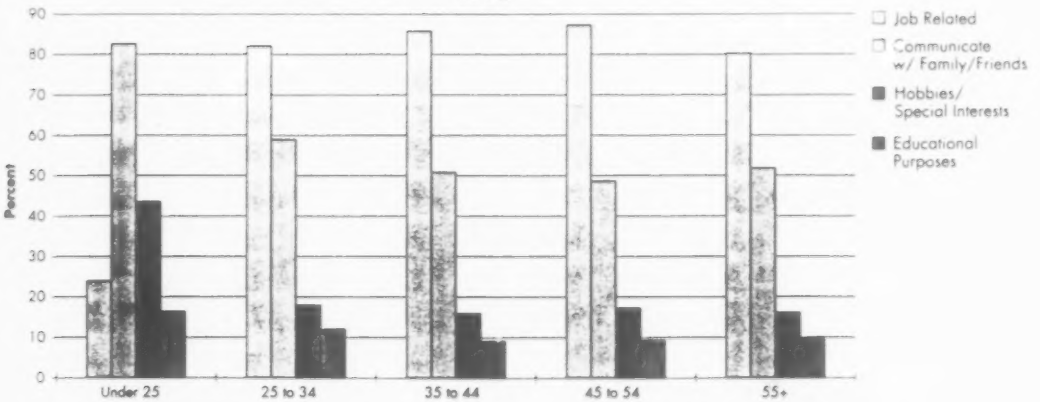
	Communicate w/ Family/Friends	Job Related	Educational Purposes	Hobbies/ Special Interests
Married Couple w/ Child <18	56.8	69.4	22.5	10.3
Male Householder w/ Child < 18	60.5	60.2	21.7	12.5
Female Householder w/ Child <18	65.6	49.1	27.8	11.3
Family Householder w/o Child <18	58.3	73.3	22.8	11.1
Non-family Households	63.8	76.1	22.2	13.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-55:

Percent of U.S. Persons Using E-Mail Outside the Home

By Subject Matter
By Age
1998



	Job Related	Communicate w/ Family/Friends	Educational Purposes	Hobbies/ Special Interests
Under 25	23.9	82.5	43.4	16.4
25 to 34	81.9	58.9	17.9	12.0
35 to 44	85.7	50.8	15.9	9.1
45 to 54	87.2	48.6	17.2	9.3
55+	80.2	51.8	16.0	9.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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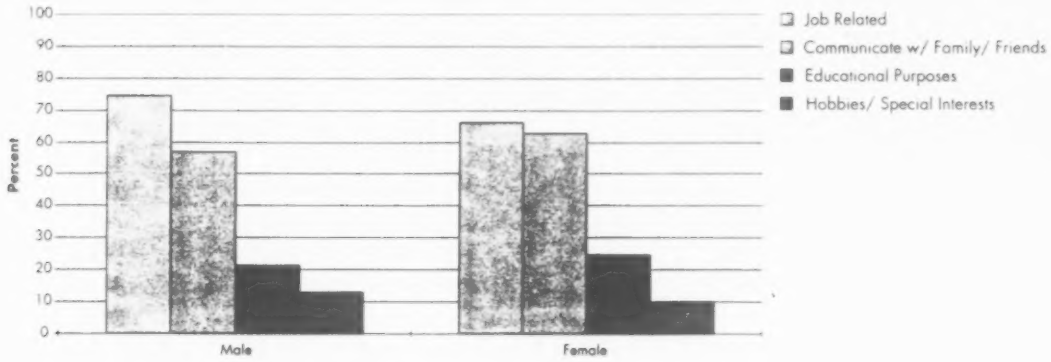
Chart II-56: **Percent of U.S. Persons Using E-mail Outside the Home**

By Subject Matter
By Gender

1998

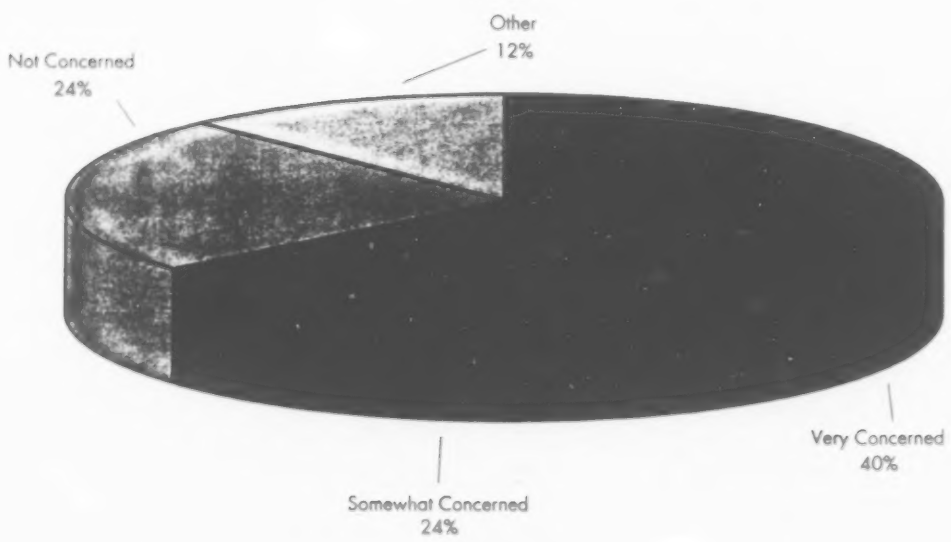


	Job Related	Communicate w/ Family/ Friends	Educational Purposes	Hobbies/ Special Interests
Male	74.6	57.0	21.2	13.0
Female	66.2	62.7	24.8	9.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-57 **Level of Concern about Internet Confidentiality Among U.S. Households**

1998



Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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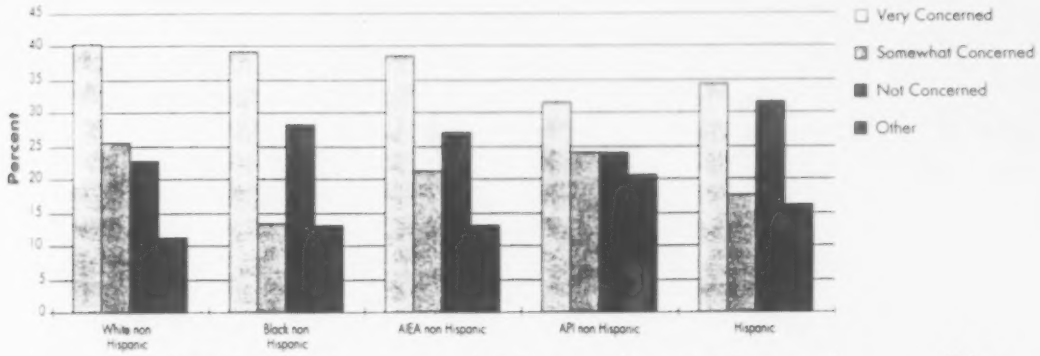
Chart II-58:

Level of Concern about Internet Confidentiality Among U.S. Households

By Race/Origin

1998



	Very Concerned	Somewhat Concerned	Not Concerned	Other
White non Hispanic	40.5	25.4	22.9	11.2
Black non Hispanic	39.1	13.4	28.4	13.2
AIEA non Hispanic	38.6	21.2	27.0	13.2
API non Hispanic	31.5	23.9	24.0	20.6
Hispanic	34.5	17.7	31.6	16.1

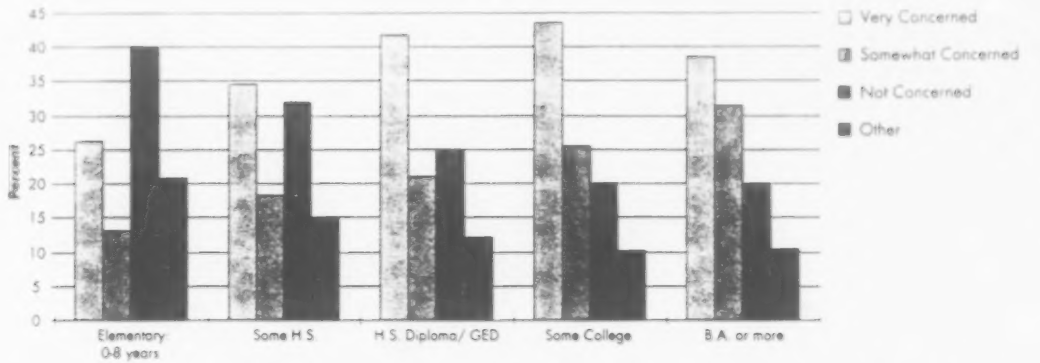
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

Chart II-59:

Level of Concern about Internet Confidentiality Among U.S. Households

By Education

1998



	Very Concerned	Somewhat Concerned	Not Concerned	Other
Elementary: 0-8 years	26.3	13.1	39.8	20.8
Some H.S.	34.7	18.2	32.0	15.1
H.S. Diploma/ GED	41.8	21.1	25.0	12.2
Some College	43.5	25.5	20.1	10.1
B.A. or more	38.5	31.3	19.7	10.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using December 1998 Current Population Surveys.

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PART III

CHALLENGES AHEAD

Traditionally, our notion of being connected to the nation's communications networks has meant having a telephone. Today, Americans' increased use of computers and the Internet has changed that notion. To be connected today increasingly means to have access to telephones, computers, *and* the Internet. While these items may not be necessary for survival, arguably in today's emerging digital economy they are necessary for success. As the Department of Commerce has found in its *Emerging Digital Economy* reports,[1] the dramatic growth of electronic commerce and the development of information technology (IT) industries are changing the way Americans work, communicate, purchase goods, and obtain information. Jobs in the new economy now increasingly require technical skills and familiarity with new technologies. Additionally, obtaining services and information increasingly requires access to the Internet.

Policymakers have achieved high levels of telephone connectivity through the implementation of two key initiatives. Pro-competition policies at the state and national levels have resulted in lower prices for consumers of telephone services. Universal service policies have helped assure that most Americans can enjoy affordable access today. Assistance for low-income households (e.g., the Federal Communications Commission's Lifeline Assistance and Link-Up America; State programs) and support for high-cost regions of the country (e.g., the FCC's Universal Service Fund; other State and Federal rate-averaging) are prime examples of such programs. And the U.S. Department of Agriculture's Rural Utilities Service (RUS) provides targeted lending and technical advice to help ensure that advanced telecommunications infrastructure is in place for rural communities.

With the data in this report, we are in a better position to identify where and how to reach everyone. Policymakers should explore ways to continue to boost telephone penetration, particularly among the underserved, and to expand computer and Internet connectivity. For some individuals, it is an economic solution. Lower prices, leasing arrangements, and even free computer deals will bridge the digital gap for them. For high cost communities and low-income individuals, universal service policies will remain of critical importance. For other individuals, there are language and cultural barriers that need to be addressed. Products will need to be adapted to meet special needs, such as those of the disabled community. Finally, we need to redouble our outreach efforts, especially directed at the information disadvantaged.

Promoting Competition and Universal Service

To some extent, the surging use of computers and the Internet among American households reflects the success of our nation's pro-competition policies. A significantly higher percentage of households owned PCs in 1998 (42.1%) than in 1997 (36.6%), and experienced greater Internet access during the same period (26.2% versus 18.6%). The increased competition among PC-providers and lower costs of manufacturing have resulted in PCs selling for well below $1000. The increasing use of other Internet-accessing devices, such as televisions, palm computers, and Internet phones, should further invigorate competition among manufacturers and reduce prices for consumers.

While competition has made computers and the Internet increasingly affordable, these technologies still remain beyond the budget of many American households. When asked why they lacked Internet access, a significant portion of households (16.8%) responded that it was too expensive. Respondents particularly

[1] The Emerging Digital Economy (April 1998) and The Emerging Digital Economy II (June 1999).

cited the cost of monthly bills, followed by toll calling for ISP access. A significantly higher percentage of minority and low-income households reported that Internet access was cost prohibitive. In addition, cost ranked highest among reasons given by those who discontinued Internet use. And, the proportion of non-use would surely be higher still for those who do not yet own PCs or other Internet-access devices. Policymakers, such as the Federal-State Universal Service Joint Board, State Public Service Commissions, and the Federal Communications Commission should carefully consider these facts in their attempts to evaluate the new universal service and access needs.

These findings suggest that further competition and price reductions will be vital to making information tools affordable for most Americans. Going forward, it will be important to promote policies that directly enhance competition among companies manufacturing computers and other Internet devices, as well as among Internet service providers. Expanding competition in rural areas and central cities is particularly significant, as these areas lag behind the national averages for PC-ownership and household Internet access.

At the same time, the data demonstrate the need for continued universal service support for telephony, particularly in rural and other high-cost areas. And we need to encourage the buildout of broadband networks to rural and other underserved areas of our nation, so that all Americans can take full advantage of new information technologies and services.

Expanding Community Access Centers

Competition is a significant answer to providing affordable access to computers and the Internet, but it is not the total solution. It is highly unlikely that, in the foreseeable future, prices will fall to the point where most homes will have computers and Internet access. As a result, a digital divide may continue to exist at home between the information rich and the information poor. Given the great advantages accruing to those who have access, it is not economically or socially prudent to idly await the day when most, if not all, homes can claim connectivity. Part of the short-term answer lies in providing Internet access at community access centers (CACs), such as schools, libraries, and other public access facilities.

The 1998 data demonstrate why providing public access to the Internet at these external sources is critical. To begin with, these sources tend to be used by groups that lack Internet access at home or at work: chiefly, minorities, people earning lower incomes, those with lower education levels, and the unemployed. Households with incomes of less than $20,000 and Black households, for example, are twice as likely to get Internet access through a public library or community center than are households earning more than $20,000 or White households. Similarly, low-income households and households with lower education levels are obtaining access at schools at far higher rates.

Moreover, the same households that are using community access centers at higher rates are also using the Internet more often than other groups to find jobs or for educational purposes. CACs are, therefore, providing the very tools these groups need to advance economically and professionally.

The data support the continued funding of CACs by both industry and government. Industry has already come forward with significant assistance. Companies are supporting the creation of community technology centers, helping connect schools through "NetDays," and donating computers and software to schools and neighborhood centers. NTIA's Telecommunications and Information Infrastructure Assistance Program (TIIAP) has funded a number of pioneering CAC efforts.[2] The U.S. Department of Education's new Community Technology Centers (CTC) program will enable the funding of CACs in economically distressed communities on a broader scale.

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[2] Networks for People: TIIAP at Work, available on NTIA's web site, includes discussions of a number of TIIAP-funded CAC projects.

The 1998 data also underscore the importance of the Administration's efforts to ensure that all schools and libraries have affordable access to the Internet. Under the E-rate program, telecommunications carriers are providing eligible schools and libraries with a discounted rate for telecommunications services, internal connections among classrooms, and Internet access. As a result, the E-rate program is helping to connect more than 80,000 schools and libraries and is enabling children and adults to both learn new technologies and have new points of access. The data demonstrate that these community access centers are, indeed, used by people who lack access at home and merit further funding.

In addition, we should look to other community-based organizations that can help us achieve these goals — traditional community centers, churches, credit unions, housing projects, senior centers, museums, fire and police stations, and more. Each community knows best how to reach and connect its residents.

Building Awarenes

While many Americans are embracing computers and the Internet, there are many others who do not realize that this technology is relevant to their lives. We need to reach out to these communities and let them know why they should care — how new technologies can open new opportunities for them and their children.

We also need to find out *why* people are or are not connected. While such outreach works best at the local level, this type of information should be shared with policymakers at all levels of government — local, state, tribal, and federal. Only when we have a good understanding about why different communities do or do not have access to digital tools can we fashion appropriate policies.

Addressing Content Concerns

The data show that Americans are concerned about invasions of their privacy caused by accessing the Internet. Almost two-thirds of American are either "very concerned" or "somewhat concerned" about confidentiality on the Internet. There are legitimate concerns regarding the collection and transmission of personal information via the Internet, especially information gathered from children. The Administration has set forth an Electronic Bill of Rights, proposing that every consumer have: the right to choose whether her personal information is disclosed; the right to know how, when and how much of that information is being used; the right to see that information; and the right to know if information is accurate and to be able to correct it if it is not.

The Administration believes that the private sector should take the lead in implementing meaningful, consumer-friendly privacy regimes. We would like for companies to take steps to notify customers of their privacy policies, process consumer privacy preferences, protect customer data, and handle inquiries and complaints. Several promising private sector initiatives are underway, such as BBBOnline and TRUSTe, which require merchants to adhere to fair trade practices. These programs provide a seal to businesses that post privacy policies that meet certain criteria.

Parents are also concerned about their children's safety while using the Internet. The data show that one of the reasons that households with a computer have never used the Internet is "concerns with children." The Administration is committed to empowering parents, teachers, and other guardians with tools to keep children safe while online. The Administration has encouraged private sector initiatives, such as "One Click Away," which are designed to give parents technology and educational resources to protect their children from material that they deem to be inappropriate and to know who to contact when their children encounter dangerous situations online. The Administration has also promoted the concept of "greenspaces" — educational, age-appropriate, noncommercial content that is easily identifiable for families online.

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Continued Monitoring

Good public policy requires a good factual foundation. Continued studies — public and private — are vital to permitting policymakers to make prudent decisions. Policymakers should explore ways to improve the availability of reliable penetration data for historically small but vitally important groups, such as Native Americans and Asians/Pacific Islanders. Potential solutions include "over-sampling" as part of a broader-based survey or conducting special studies that target these groups. A new analytical tool to gauge the status of Internet connectivity could be a Household Access Index, designed to highlight progress or deficiencies in this regard. A composite index could be developed that represents the country's combined penetration for telephones, computers, other Internet access devices, and the Internet. In 1998, the HAI for U.S. households would have equaled 162.4%, increasing from 149.0% in 1997.

In the final analysis, no one should be left behind as our nation advances into the 21st Century, where having access to computers and the Internet may be key to becoming a successful member of society.

APPENDIX

TRENDLINE STUDY ON ELECTRONIC ACCESS BY HOUSEHOLDS: 1984-1998

A. INTRODUCTION

The "trendline study" in this Appendix identifies household trends in telephone, computer, and Internet penetration rates from 1984 through 1998. This historic review relies on data collected by the U.S. Department of Commerce's Bureau of the Census during the watershed period of pro-competition and regulatory reform policies following the breakup of the former Bell System through court decree. Specifically, we have relied on the Census Bureau's Current Population Surveys (CPS) conducted in 1984, 1989, 1994, 1997, and 1998. In a special supplement to each CPS, the Census Bureau compiled the requisite data by surveying 48,000 or more households. The Census Bureau also cross-tabulated the information gathered according to specific variables, such as income, age, race, educational level, and geographic categories (such as urban, rural, and central city, as well as nationally and by region).

The following analysis highlights many of the significant trends in electronic access during the past fifteen years. For each topic, we have summarized some key findings, examined the changing profile of the "most" and "least" connected, and analyzed the impact of specific demographic variables. The accompanying charts provide a wealth of data that we have only begun to tap. These data and charts should provide invaluable information for policymakers and researchers continuing to explore this area.[1]

B. TELEPHONE PENETRATION

1. Highlights

Stable penetration rates. A review of the CPS time series data demonstrates that Americans have maintained consistently high telephone penetration rates between 1984 and 1998. On average, 91.6% of Americans were connected by telephone in 1984. That percentage rose to 94.2% by 1993 but has failed to surpass that level over the last 5 years. In 1998, U.S. penetration stood at 94.1%. During 1994-1998, rural, urban, and central city areas increased slightly, and by 1998 all areas approximated 94% except for central city (92.9%). (Chart A-1)

Narrowing subscribership gap. The most significant change during the 1984-1998 time period is the particularly high rate of growth in telephone subscribership among households that have traditionally been the least connected. Households that were far less likely to own telephones in 1984 (such as those earning less than $10,000 and unemployed households) still lag behind the national average, but are now far more likely to own telephones. (Chart A-2) Low-income households (those earning less than $5,000) experienced a particularly high rate of growth (nearly 10%) between 1984 and 1998. Id.

At the same time, households that were the most connected (*e.g.*, those earning higher incomes, seniors, and employed households) have experienced a slight decline in telephone penetration rates in the last few years. The reasons for this decline are unclear. It may be due, in part, to the growing prevalence and substitution of wireless devices, which were not included in the survey results. At any rate, with the rapid growth in telephone penetration among the least connected and a slight decline among certain connected groups, the gap between those with and without telephones has decreased.

[1] Most of the data presented in this report include statistics through the year 1998, with one notable exception. In 1998, the CPS supplement survey discontinued the question about modems in the household. Analysts believed a direct question about Internet access would be more meaningful than ownership of a modem.

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2. Profiles of the Most and Least Connected

Not surprisingly, households earning high incomes continue to be the most connected, and those with low incomes (particularly those earning less than $5,000) have remained the least connected. In 1989, low-income households living in central cities had the lowest telephone subscription rates (72.6%, compared to 73.8% in rural areas and 76.2% in urban areas); in 1998, by contrast, low-income families living in rural areas were the least connected (76.3%, compared to 78.7% in central cities and 79.2% in urban areas). Geographic location has played far less of a role with regard to penetration rates at higher incomes.

3. Variables in Telephone Penetration

- ***Income*** directly correlates with the rate of telephone ownership among households, although the gap between the higher and lower income brackets is decreasing. (Chart A-2) While those at the lowest income levels have continued to lag behind higher income households in telephone penetration, the lowest income bracket experienced a significant growth in penetration between 1984 and 1998 (from 71.8% in 1984 to 78.7% in 1998), considering that telephony is a mature technology. In the meantime, while penetration rates have remained consistently high across higher income households, there has been a slight decrease in penetration rates among all households earning more than $10,000 in the last several years. This has occurred no matter whether the household is located in a rural, urban, or central city area.
- ***Race/Origin.*** Telephone penetration also continues to vary by race/origin. Blacks and Hispanics lagged nearly ten percentage points behind Whites in 1989 (86.5% and 86.4%, compared to 95.9%). (Chart A-3) That pattern has changed little over time; in 1998, Blacks still lagged by more than seven percentage points and Hispanics by more than six points.
- ***Household type*** also plays a significant role, as single-parent households have continued to trail all other household types. (Chart A-5) In 1997, their telephone rates declined to their lowest recent point (87.1% for male-headed households, and 86.3% for female-headed households). Connectivity for these two groups has improved in the last year, although not to 1994 levels.
- ***Age*** has also traditionally been a factor in the rate of telephone penetration, with the 55+ households constituting the most connected group in the last fourteen years. (Chart A-6) Nevertheless, while those householders below 25 years of age remain the least connected, telephone penetration for this group has increased significantly (from 76.1% in 1984 to 87.6% in 1998). As a result, the 19.4 percentage point gap between the oldest and youngest age groups in 1984 narrowed to an 8 percentage point gap in 1998.

C. COMPUTER OWNERSHIP

1. Highlights

Increasing Computer Ownership. Computer ownership has soared for all groups in the last fourteen years. The rate of ownership has grown rapidly for all demographic groups: at least fivefold across races and ethnic groups, and more than fourfold across all age groups, and all educational groups, for example.

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Prevailing Factors in Computer Ownership. While ownership has increased for all groups, certain characteristics continue to be strong determinants of the rate of growth and of a household's likelihood of owning a computer. Income, race, and education level, for example, continue to closely correspond with the computer penetration rate.

At the same time, age and employment status are beginning to become less significant variables, particularly as seniors and those "not in the labor force" buy computers with increasing frequency. In 1984, 2.5% of households 55 and older owned personal computers (PCs), compared to 15.5% of 35-44 year-olds. In 1998, one-quarter of seniors (25.0 %) owned PCs. Whether a family has children is also becoming a less significant determinant of whether the household owns a computer. (Chart A-13) In 1984, non-family households were particularly unlikely to own PCs (3.7%), followed by family households without children (5.1%). In 1998, these two categories of households are still less likely to own computers than households with children, but nevertheless now buy computers at a far higher frequency (27.5%, and 43.2%, respectively).

Widening Ownership Divide. The rate of growth has also had a more significant impact on some groups than others. Those that were most likely to own PCs in 1984, are now especially likely to own them in 1998, even though they may have experienced a lower rate of growth than other groups. For example, for the highest income group (those earning $75,000 and above), ownership has grown nearly fourfold (from 22.1% to 79.9%). While the growth rate for the lowest income group (those under $5,000) was nearly tenfold during the same period, only one of six households at this income bracket owned computers in 1998. (Chart A-8)

The trend of seeing the "computer-rich get richer" means that the digital divide among groups is widening over time. The twenty percentage point difference that existed between the highest and lowest income levels in 1984 has now expanded to a 64 percentage point difference. What was a fifteen percentage point gap in 1984 between those with a college degree and those with elementary education is now nearly a 61 percentage point gap. These trends will continue to occur until the relative growth rates among the least connected significantly surpass the growth rates for the more connected on a sustained basis.

2. Profiles of the Most and Least Connected

Certain households have continued to own PCs at higher rates: those earning higher incomes, those with a college degree or higher, households consisting of married couples with children, households located in the West region of the country, and those that are employed. One significant change has occurred based on race/ethnic origin. In 1984, White households accounted for the highest computer penetration rate; in 1989, they were surpassed by "other non-Hispanic" (*e.g.*, Asians, American Indians, and Eskimos) households, which held an even more significant lead in 1998. (Chart A-11)

In examining the "least connected," households earning lower incomes, those with lower education levels, those located in the South, and those under the age of 25 have consistently had lower computer ownership rates. In particular, households earning low incomes and living in rural areas have repeatedly reported the lowest penetration rates. Rural black households have also remained the least likely group to own a PC (2.7% in 1984, 17.9% in 1998), followed by Hispanics living in central cities (3.1% in 1984, 21.4% in 1998).

3. Variables in Computer Penetration

- ***Income*** continues to strongly influence computer ownership rates. (Chart A-8) In 1984, households earning $75,000 and higher were far more likely — by twenty percentage points — to own a PC, than households earning less than $5,000. Since 1984, the gap in PC-ownership rates has continued to widen. Nearly 80% of households earning above $75,000 owned a PC in 1998 — sixty-four percentage points above (or five times more than) those at the lowest income level. Low-income households in rural areas have remained the least likely to own a computer. (Chart A-9)

- ***Race/Origin*** also remains closely correlated with computer ownership. (Chart A-10) In 1984, White households owned nearly twice the number of PCs as Black and Hispanic households. "Other non Hispanic households" trailed White households, on the other hand, by only 0.4 percentage points. Between 1984 and 1998, White households' penetration rates increased approximately fivefold, and all other race/ethnic groups experienced approximately a sixfold increase. Because of their similar growth rates, White households continued to own computers at a rate roughly twice that of Black and Hispanic households in 1998. Beginning in 1989, however, "other non Hispanic" households began to exceed all groups in PC ownership. Location has also influenced the rate of PC ownership among race/ethnic groups. (Chart A-11) Black and "other non Hispanic" households in rural areas have remained far less likely than those in urban areas or center cities to own a computer, while Hispanic households in central cities have lagged behind those in rural and urban areas.

- ***Education*** remains closely correlated with computer ownership. (Chart A-12) Indeed, between 1984 and 1998, the gap between households with an elementary education and those with a college degree or higher has increased significantly. In 1984, the gap between these two groups was approximately fifteen percentage points; in 1998, the gap rose to approximately sixty-one percentage points.

- ***Household type*** also plays a significant role. Married couples w/children have remained the most connected group, particularly in urban areas. (Charts A-13) Non-family households have remained the least connected group, especially those in rural areas. One significant change is the rapid increase (more than eight-fold) in computer ownership among "family households without children." In 1984, that was the second least connected group; in 1998, it was the second most connected group. Also significant is the widening disparity between male and female-headed households. In 1984, there was little difference between the two (6.7% for female-headed versus 6.9% for male-headed). In 1989, however, PC penetration rates among male-headed households began to soar, creating a significant gap with female-headed households (31.7% for female-headed versus 35.0% for male-headed). This gap has only begun to narrow in recent years.

- ***Age*** is becoming less determinative of computer ownership. (Chart A-14) In 1984, the 35-44 year old group was significantly ahead of other age groups. In 1998, it was only marginally ahead of the 45-54 year old group and slightly ahead of the 25-34 year group. Most significantly, seniors appear to be catching up, due to a ten-fold increase in PC ownership between 1984 and 1998. In 1984, there were approximately six times as many with PCs in the 35-44 year category as in the 55+ category (15.5% compared to 2.5%); in 1998, that ratio dropped to a little more than double (54.9% versus 25.8%). Households under 25 are also gaining ground: in 1984, the 35-44 year group was three times as likely to own a PC as those under 25, but was about 1.7 times as likely in 1998. Those households under 25 living in rural areas are still the least likely, however, to own a PC.

- ***Region.*** The West has remained significantly ahead of other regions in computer ownership from 1984 to 1998. (Chart A-15) Significantly, the Northeast was the second highest connected region in 1984 (8.5%); but in 1997, the Midwest took second place (42.9%. Meantime, the South (particularly the rural areas) has lagged far behind other areas in PC penetration rates. (Chart A-16)

D. INTERNET ACCESS

An examination of CPS time series data reveals several clear-cut trends with respect to the on-line experience of U.S. households since the break-up of AT&T. The discussion below focuses on the Internet—the ability of Americans to access it by modem and to use it (for e-mail). More specifically, the analysis documents growing information access and exchange, a widening digital gap, and the demographic and geographic profiles of those who are most and least connected.

The data used in this discussion pertain to modem ownership and e-mail access among households. Until 1998, modem ownership was measured as a means of determining the level of Internet access. That practice ceased in 1998 because nearly all computers contain modems today and because modems, in practice, are not always used to connect to the Internet. Nevertheless, for historical purposes, modem ownership serves as the best proxy available for measuring Internet access.

1. Modems[2]

a. Highlights

Growing information access and exchange. As gauged by household ownership of modems, Americans have dramatically increased their ability to access the Internet. In 1989, only 3.3% of the nation's households possessed modems; by 1997, the figure had rocketed to 26.3%, an eightfold increase. Viewing Internet access through various demographic perspectives provides a similar picture of tremendous growth in modem ownership.

Widening digital divide. In general, underserved groups (such as low-income users) and rural areas have fallen further behind the modem ownership leaders in their respective categories in recent years.

b. Profiles of the Most and Least Connected

The CPS data affords some illuminating profiles of the Americans who are the most and least connected.

- Those Americans enjoying the greatest connectivity today are typically high-income households. Holding income constant, other highly-connected groups include Whites or Asians, middle-aged, highly-educated, employed, and/or married couples with children, most often found in urban areas and the West. Conversely, the least connected generally are low-income, Black, Hispanic, or Native American,[3] senior in age, not employed, single-parent (especially female-headed) households, those with little education, and those residing in central cities or especially rural areas. These profiles generally prevailed during 1989-97 albeit some changes occurred (e.g., the South fell into last place among regions).

[2] The charts in this section may be found at NTIA's web site at www.ntia.doc.gov.

[3] By "Native Americans" this report is referring to American Indians, Eskimos, and Aleuts.

- ***Income.*** From 1989 through 1997, modem ownership increased for all income levels. Penetration rose tenfold in income brackets below $20,000 and increased at a decreasing rate in the higher income brackets, registering growth of 4.2 times at the $75,000 and over bracket. Despite greater growth rates by the lower income households, the percentage point gap between lowest and highest penetration (for the $5,000-9,999 group versus the wealthiest households) grew from 13.4 percentage points in 1989 to 56.5 percentage points in 1997. During this period, rural areas have generally experienced greater growth than central city and especially urban areas, but generally still trail the other two.

- ***Race/origin.*** During 1989-97, household modem penetration rose in every category of race/origin. White non Hispanic, Black non Hispanic, "Other non Hispanic," and Hispanic each grew eightfold or more. Because White and "Other non Hispanic" households started from a higher proportion, the digital gap has widened considerably compared to Blacks and Hispanics. For example, the frontrunner "Other non Hispanic" group (*e.g.*, American Indians, Aleuts, Eskimos, Asians, Pacific Islanders) outdistanced Blacks and Hispanics by more than 22 percentage points in 1997, compared to 2.0 and 2.22 in 1989. That pattern generally holds whether rural, urban, or central city, although White households have the highest penetration in rural areas (24.6%).

- ***Education.*** During the eight-year period (from 1989 to 1997), the digital gap mushroomed to more than a fivefold increase (from a 8.6 to a 46.3 percent point difference) between those households of the lowest and the highest educational levels. This result can be explained largely in terms of the very low penetration rates exhibited by the less-educated households in 1989. This pattern generally holds in rural, urban, or central city areas, with the largest disparity in rural environs.

- ***Household type.*** The ownership of modems by all types of households grew substantially during 1989-97, registering sevenfold gains or more. As in 1989, households comprised of a married couple with children eighteen years old or younger led all other categories (4.9% in 1989, 42.5% in 1997). Single-parent households with children lagged considerably; female households with children trailed all others throughout the period (1.0% in 1989, 15.4% in 1997) but grew fifteenfold over the span — faster than any other category. The digital gap expanded from 3.9 percentage points to 27.1. Both types of single-family rural households with children registered only a 0.5% modem penetration in 1989, but rocketed more than thirtyfold by 1997.

- ***Age.*** Modem ownership in each age bracket grew approximately sevenfold or more. Middle-aged householders (35-54 years) led all other categories, equaling more than 35.0% in 1997. Senior citizens exhibited the lowest penetration throughout the period, registering 13.2% in 1997. However, the seniors' elevenfold growth rate in modem ownership exceeded all other brackets. Between 1989-1997, the digital gap in terms of percentage points increased by roughly sixfold between the two groups. Urban middle-aged householders possessed the highest ownership rate (36.0%+), while rural seniors had the lowest penetration (11.2%) but the greatest growth rate (almost 13.0% from 1989-97).

- ***Employment.*** Modem ownership rose more than seven times for both the employed and unemployed, and more than 14 times for the many-faceted not-in-labor-force category. In 1997, the highest penetration occurred among the urban employed (34.5%), while the lowest gauge belonged to the not-in-labor-force category in rural areas (9.0%). From 1989 to 1997, the

digital gap increased from a 3.6 to a 21.7 percentage point differential. The greatest growth over the period 1989-97 occurred in rural America for the employed and unemployed, and in urban areas for the not-in-labor-force.

- ***Region.*** The West exhibited the highest modem penetration in both 1989 (4.5%) and 1997 (30.8%), and no region experienced less than a sevenfold increase. The digital gap grew modestly, from 1.9 percentage points to 6.4. Whether in areas that were rural, urban, or central city, the Midwest grew more than any other region, bumping the South into last place. Rural areas frequently experienced greater growth rates than their urban or central city counterparts but often fell further behind in percentage-point differentials in urban-rural comparisons.

2. E-mail Use

a. Highlights

E-mail usage also grew at a tremendous rate during the shorter, more recent interval 1994-98. Usage by all races or ethnic origins grew at least 3.5 times during the span. Every income and educational level as well as labor force category exhibited growth of four times or more. All age groups have increased by at least 4.5 times, while usage by household types and regions rose some fivefold.

Widening digital divide. The digital gap also widened in all major categories with respect to e-mail usage during 1994-98. With the exception of regional use (where the West's lead more than doubled), such usage rose by fourfold (or more) regarding income, race/origin, age, educational level, household type, and labor force. Interestingly, the gap actually declined from the 1997-98 period with respect to income, but grew substantially over the longer period 1994-98.

b. Profiles of the Most and Least Connected

The profiles for e-mail usage are similar to those of modem users. Some notable changes between 1994-1998 include surges by certain rural areas. In the Northeast, rural households led all others in the region and all other rural areas across regions. Additionally, female households with children in rural areas overtook those types of households in urban America or central cities.

- ***Income.*** E-mail usage increased at all income levels by fourfold or more during 1994-98. Although usage rose more than four times to 6.2% at the lowest-income level (under $5,000) by 1998, the digital gap grew from 8.8 percentage points to 37.5. (Chart A-18) Unexpectedly, both the lowest-income and the highest income levels experienced declines in usage from 1997 to 1998 (*i.e.*, 7.2% to 6.2%, and 45.1% to 43.7%, respectively). At each income level, rural areas lagged behind urban and central city areas.

- ***Race/Origin.*** All groups registered growth of 3.5 times or more. Black and Hispanic household usage remained substantially behind Whites and non Hispanics in both 1994 and 1998. The digital gap more than quintupled during the period. (Chart A-19) The Whites' category usage of e-mail led in rural and urban areas, and also in central cities in 1998. (Chart A-20)

- ***Age.*** E-mail usage grew at least 4.5 times at each age level during the period. Senior citizens (55+ years) trailed all other age brackets in both 1994 and 1998. The digital gap more than quadrupled, from 3.5 percentage points to 14.6. (Chart A-23) Although exhibiting some of the highest growth, rural areas consistently lagged behind other areas in each age category.

- ***Education.*** E-mail use and level of education are also correlated. All levels experienced at least a fourfold growth rate in usage. The digital gap between elementary school-educated and

college-educated households grew from 8.7 percentage points in 1994 to 37.5 in 1998. (Chart A-21) Those households in rural areas have consistently lagged behind urban areas but surpass central cities, except at the lowest and highest age brackets.

- ***Household type.*** Every type of household increased their e-mail use by at least a factor of five except for male householders with children (three times). Usage by households composed of married couples with children led all other categories throughout the period by a substantial margin and equaled 25.9% in 1998. The latter figure decreased from that registered in 1997, 26.2%. Least usage occurred with female householders with children over the same time, registering 10.1% in 1998. The digital gap widened during the span, increasing from 3.9 percentage points in 1994 to 15.8 in 1998. (Chart A-22) Surprisingly, the gap decreased from 1997 to 1998 by 4.2%. Throughout the 1994-98 span, rural area usage consistently trailed other areas for all household types except for the female householder with children category, where over time rural overtook both urban and central cities.
- ***Region.*** E-mail usage experienced fivefold growth or more during the period in every region. The West has consistently led all other regions during the four-year period. The digital gap grew somewhat, increasing from 2.3 percentage points to 5.9. (Chart A-24) The West has led in urban and central city areas, but the Northeast led in rural America. Except for the Northeast, rural areas generally trailed other areas.

E. CONCLUSION

The trendline study for 1984-1998 reveals a number of promising patterns over the last fifteen years. While telephone penetration rates have stabilized, the traditional "have nots" (*e.g.*, households with lower incomes, lower education levels, those under age 25, and certain minorities) have become more connected over time. Nevertheless, these groups are still less likely to have a telephone than other households.

The patterns for computer ownership and Internet access are radically different from telephone ownership. All groups in all areas of the country have dramatically increased their access to electronic services. As a result, computers have become far more pervasive, as illustrated by their increasing use among seniors. Internet access has become more common among households of different demographic characteristics.

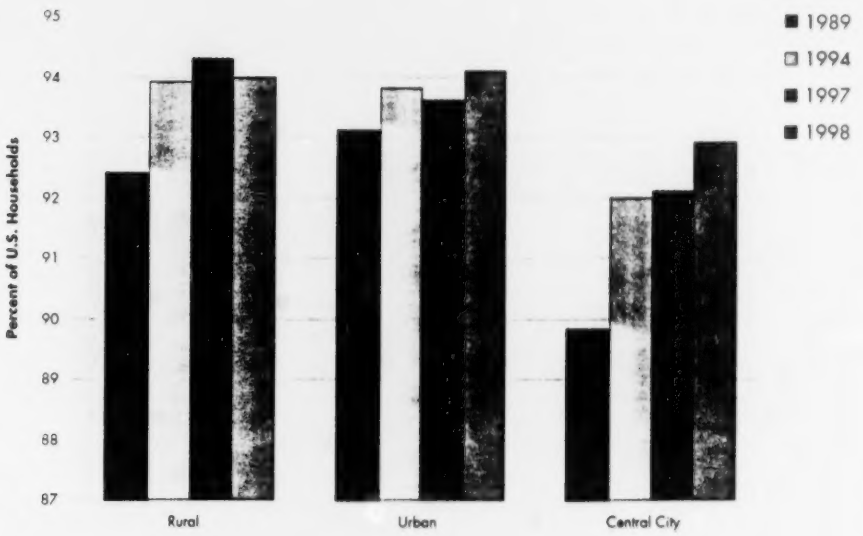
Despite these patterns of growth, the information "haves" have dramatically outpaced the information "have nots" in their access to electronic services. As a result, the gap between these groups — the digital divide — has grown over time.

Chart A-1:

Percent of U.S. Households with a Telephone

By Rural, Urban, and Central City Areas

1989-1998 (Selected Years)



Area	1989	1994	1997	1998
Rural	92.4	93.9	94.3	94.0
Urban	93.1	93.8	93.6	94.1
Central City	89.8	92.0	92.1	92.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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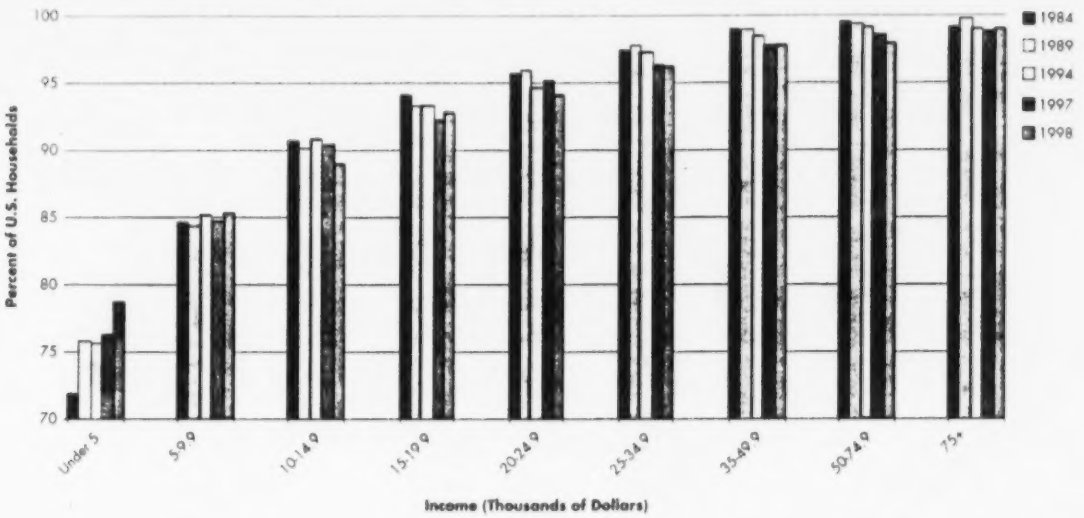
Chart A-2:

Percent of U.S. Households with a Telephone

By Income

1984-1998 (Selected Years)



Household Income	1984	1989	1994	1997	1998
Under $5,000	71.8	75.8	75.7	76.3	78.7
5,000 - 9,999	84.6	84.3	85.1	84.8	85.2
10,000 – 14,999	90.7	90.1	90.8	90.4	89.0
15,000 – 19,999	94.1	93.3	93.3	92.2	92.8
20,000 – 24,999	95.6	95.9	94.6	95.1	94.1
25,000 – 34,999	97.4	97.8	97.2	96.3	96.2
35,000 – 49,999	99.0	98.9	98.4	97.8	97.8
50,000 – 74,999	99.5	99.4	99.1	98.6	97.9
75,000+	99.1	99.7	99.0	98.8	98.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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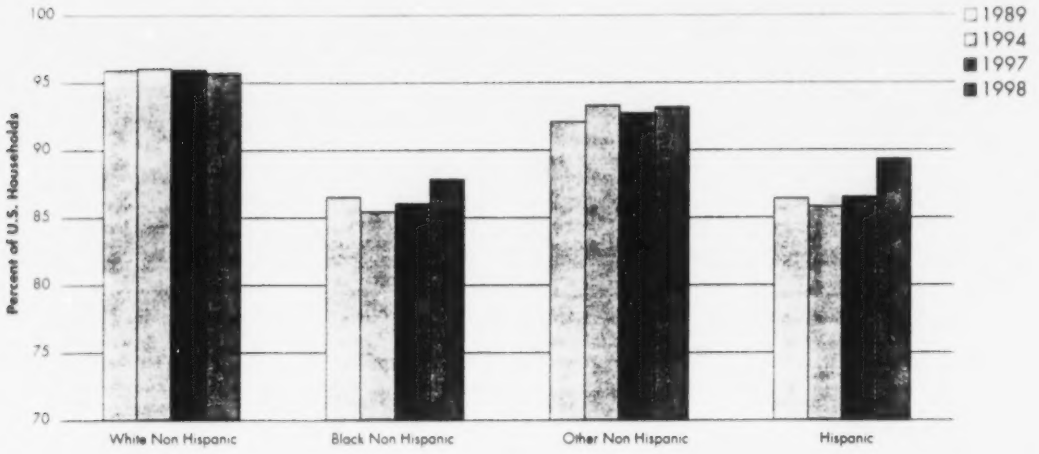
Chart A-3:

Percent of U.S. Households with a Telephone

By Race/Origin

1989-1998 (Selected Years)



Race/Origin	1989	1994	1997	1998
White Non Hispanic	95.9	96.0	95.9	95.7
Black Non Hispanic	86.5	85.4	86.0	87.8
Other Non Hispanic	92.1	93.3	92.7	93.2
Hispanic	86.4	85.8	86.5	89.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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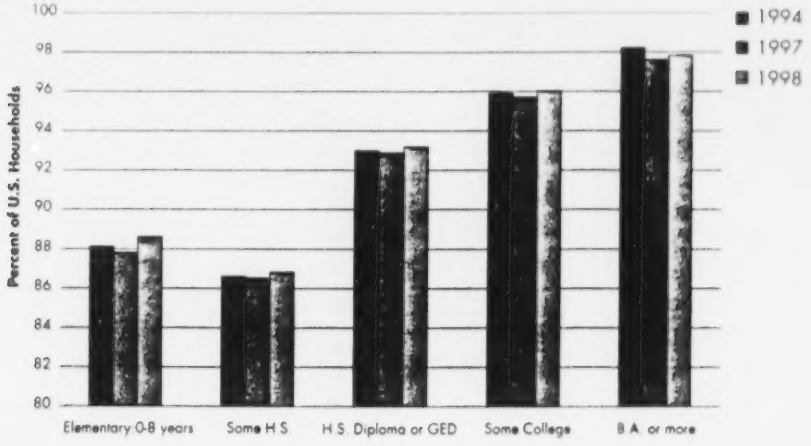
Chart A-4:

Percent of U.S. Households with a Telephone

By Education

1994-1998 (Selected Years)



Education	1994	1997	1998
Elementary:0-8 years	88.1	87.8	88.6
Some H.S.	86.6	86.5	86.8
H.S. Diploma or GED	93.0	92.9	93.2
Some College	95.9	95.7	96.0
B.A. or more	98.2	97.6	97.8

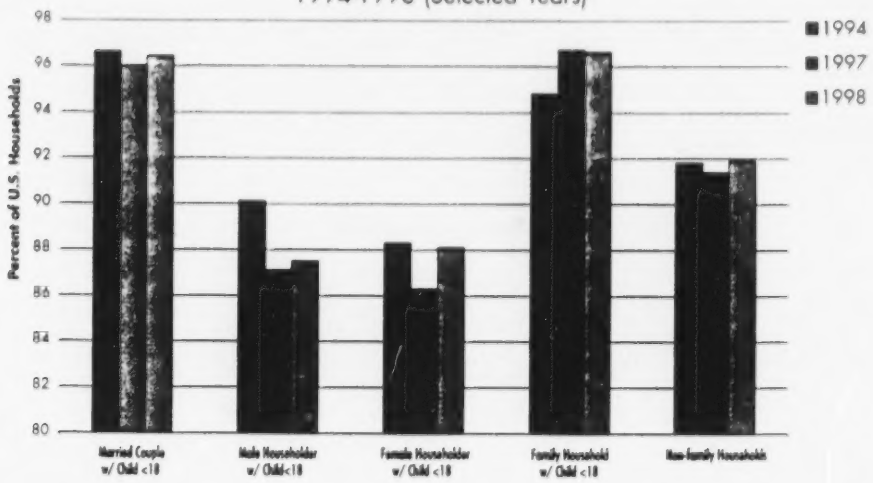
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, October 1997, and December 1998 Current Population Surveys.

Chart A-5:

Percent of U.S. Households with a Telephone

By Household Type

1994-1998 (Selected Years)



Household Type	1994	1997	1998
Married Couple w/ Child <18	96.6	96.0	96.4
Male Household w/ Child <18	90.1	87.1	87.5
Female Household w/ Child <18	88.3	86.3	88.1
Family Household w/ Child <18	94.8	96.7	96.6
Non-family Households	91.8	91.4	91.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, October 1997, and December 1998 Current Population Surveys.

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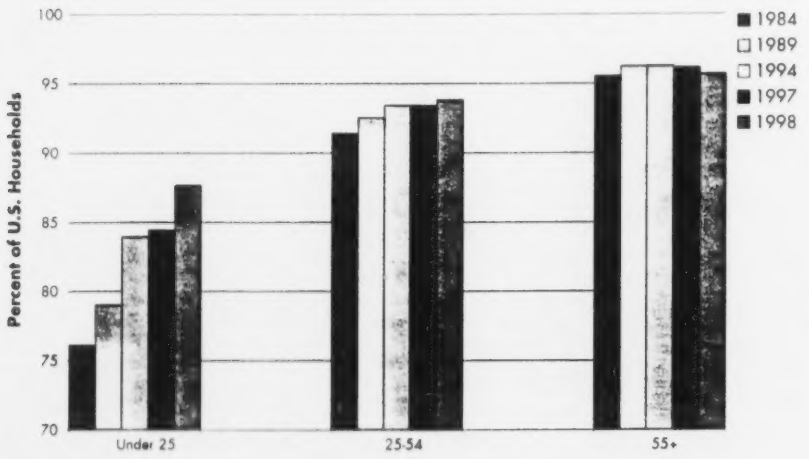
Chart A-6:

Percent of U.S. Households with a Telephone

By Age

1984-1998 (Selected Years)



Age	1984	1989	1994	1997	1998
Under 25	76.1	79.0	83.9	84.4	87.6
25 - 54	91.4	92.5	93.4	93.4	93.8
55+	95.5	96.2	96.2	96.1	95.6

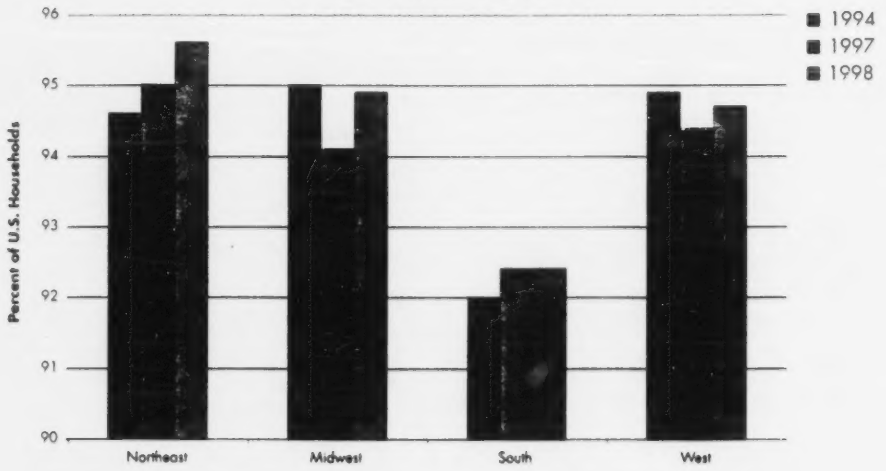
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

Chart A-7:

Percent of U.S. Households with Telephone

By Region

1994-1998 (Selected Years)



Region	1994	1997	1998
Northeast	94.6	95.0	95.6
Midwest	95.0	94.1	94.9
South	92.0	92.4	92.4
West	94.9	94.4	94.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, October 1997, and December 1998 Current Population Surveys.

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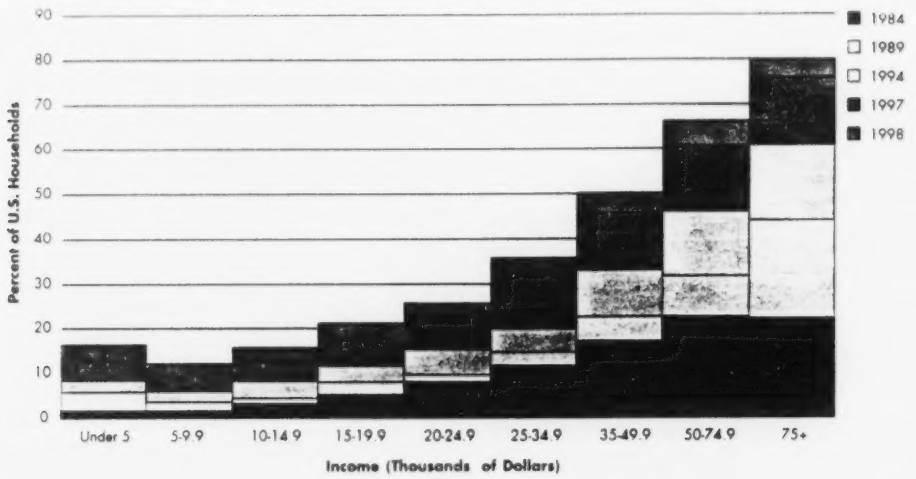
Chart A-8:

Percent of U.S. Households with Computers
By Income

1984-1998 (Selected Years)



Household Income	1984	1989	1994	1997	1998
Under $5,000	1.6	5.8	8.4	16.5	15.9
5,000 - 9,999	1.7	3.7	6.1	9.9	12.3
10,000 - 14,999	3.3	4.5	8.2	12.9	15.9
15,000 - 19,999	5.3	8.0	11.7	17.4	21.2
20,000 - 24.999	8.1	9.6	15.2	23.0	25.7
25,000 - 34,999	11.7	14.6	19.8	31.7	35.8
35,000 - 49,999	17.0	22.5	33.0	45.6	50.2
50,000-74,999	22.4	31.6	46.0	60.6	66.3
75,000+	22.1	43.9	60.9	75.9	79.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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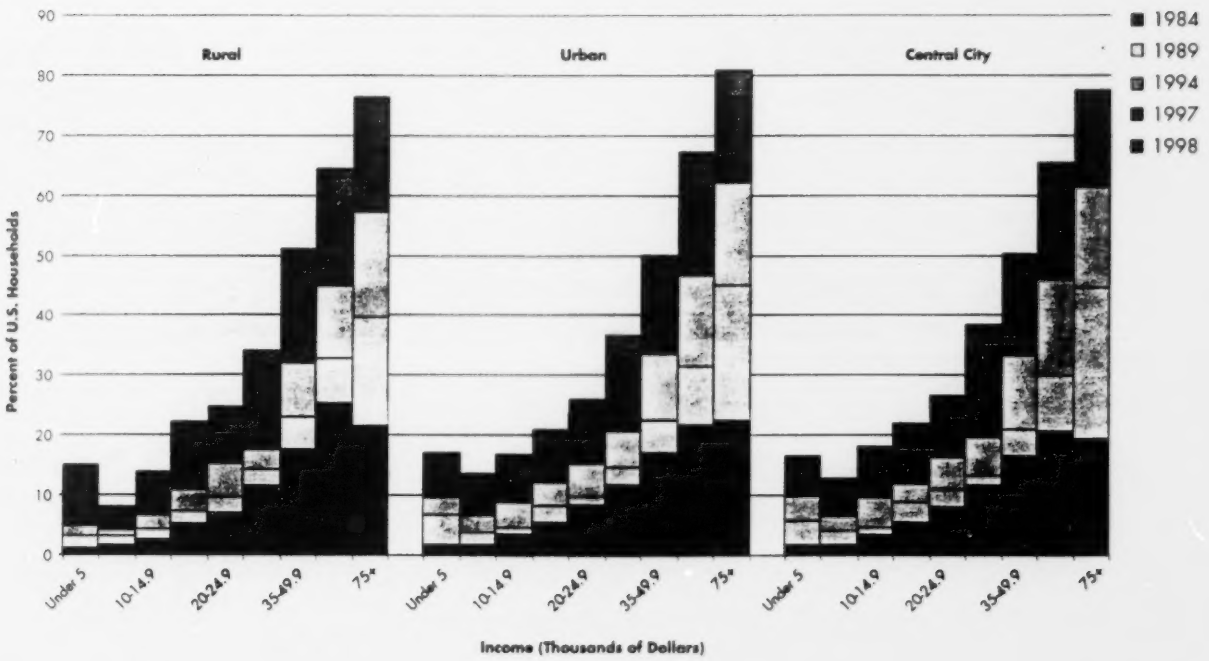
Chart A-9:

Percent of Households with Computers

By Income

By Rural, Urban and Central City Areas

1984-1998 (Selected Years)



Household Income	Rural					Urban					Central City				
	1984	1989	1994	1997	1998	1984	1989	1994	1997	1998	1984	1989	1994	1997	1998
Under $5,000	1.1	3.0	5.0	15.0	11.9	1.8	6.8	9.4	16.9	16.9	1.7	5.6	9.9	16.4	15.7
5,000 - 9,999	1.5	3.1	4.2	7.9	8.1	1.8	3.9	6.7	10.5	13.6	1.8	4.2	6.4	11.0	12.9
10,000 - 14,999	2.6	4.4	6.7	11.0	13.8	3.7	4.6	8.7	13.5	16.6	3.4	4.6	9.4	13.2	17.9
15,000 - 19,999	5.1	7.3	10.7	17.0	22.1	5.4	8.3	12.1	17.5	20.8	5.4	8.8	11.9	17.8	21.8
20,000 - 24,999	7.0	9.4	15.3	20.9	24.7	8.5	9.8	15.1	23.7	26.1	8.1	10.8	16.3	24.4	26.6
25,000 - 34,999	11.5	14.1	17.6	31.7	34.0	11.8	14.7	20.6	31.7	36.5	11.5	13.1	19.6	31.0	38.3
35,000 - 49,999	17.4	22.8	31.8	45.0	51.0	16.9	22.4	33.4	45.9	50.0	16.5	20.8	33.3	46.4	50.2
50,000 - 74,999	25.3	32.6	44.7	59.6	64.2	21.6	31.3	46.5	60.9	67.1	20.5	29.8	45.8	60.0	65.4
75,000+	21.5	39.6	57.0	75.3	76.5	22.3	44.9	61.9	76.0	80.8	19.4	44.6	61.3	73.9	77.3

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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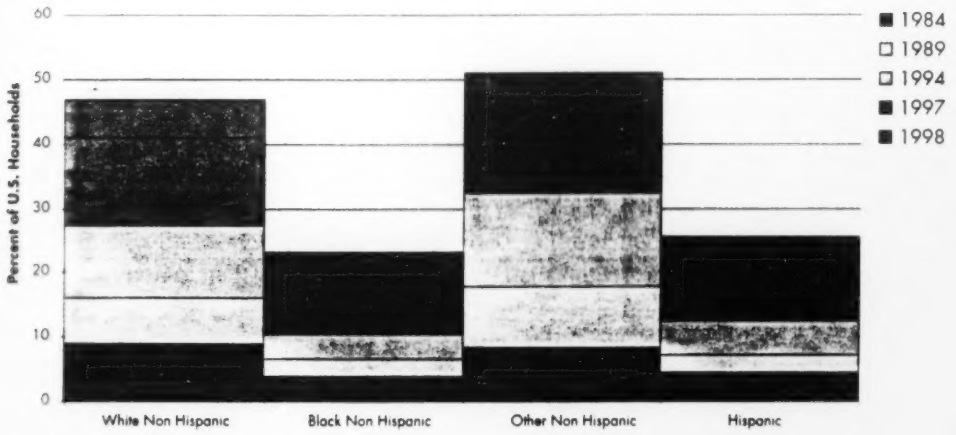
Chart A-10:

Percent of U.S. Households with Computers

By Race/Origin

1984-1998 (Selected Years)



Race/Origin	1984	1989	1994	1997	1998
White Non Hispanic	8.8	16.0	27.1	40.8	46.6
Black Non Hispanic	3.8	6.6	10.3	19.3	23.2
Other Non Hispanic	8.4	17.6	32.6	47.0	50.9
Hispanic	4.3	7.1	12.3	19.4	25.5

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

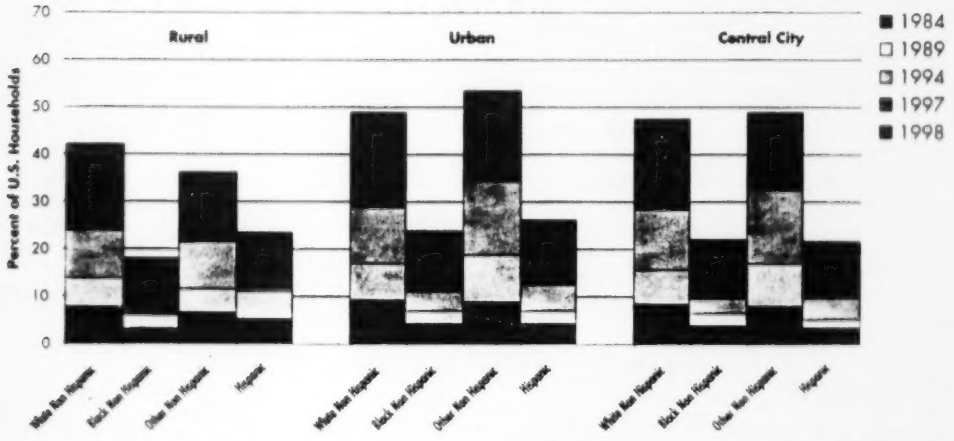
Chart A-11:

Percent of Households with Computers

By Race/Origin

By Rural, Urban and Central City Areas

1984-1998 (Selected Years)



Race/Origin	Rural					Urban					Central City				
	1984	1989	1994	1997	1998	1984	1989	1994	1997	1998	1984	1989	1994	1997	1998
White Non Hispanic	7.7	13.8	23.6	36.7	42.0	9.2	16.9	28.6	42.5	48.5	8.3	15.6	28.2	41.5	47.4
Black Non Hispanic	2.7	3.4	5.9	14.9	17.9	4.0	7.0	11.0	19.9	23.8	3.7	6.2	9.7	17.1	21.8
Other Non Hispanic	6.4	11.4	21.4	35.8	31.1	8.8	18.6	34.3	48.4	53.3	7.7	17.0	32.4	43.5	48.8
Hispanic	5.1	10.7	11.6	19.2	23.2	4.0	6.7	12.3	19.4	25.7	3.1	5.2	9.5	16.2	21.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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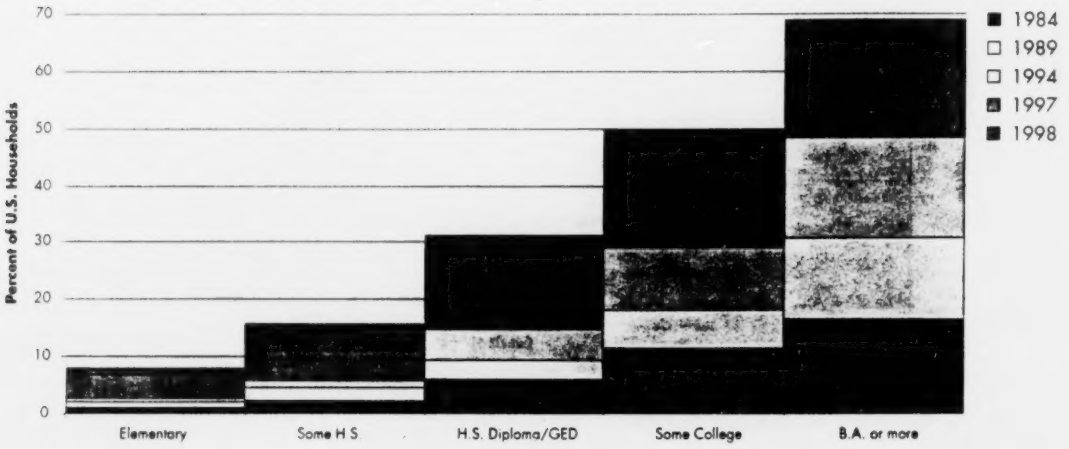
Chart A-12:

Percent of U.S. Households with Computers

By Education

1984-1998 (Selected Years)



Education	1984	1989	1994	1997	1998
Elementary	0.9	1.9	2.6	6.8	7.9
Some H.S.	2.3	4.5	6.0	10.9	15.7
H.S. Diploma/GED	5.9	9.1	14.8	25.7	31.2
Some College	11.3	18.1	28.9	43.4	49.3
B.A. or more	16.4	30.6	48.4	63.2	68.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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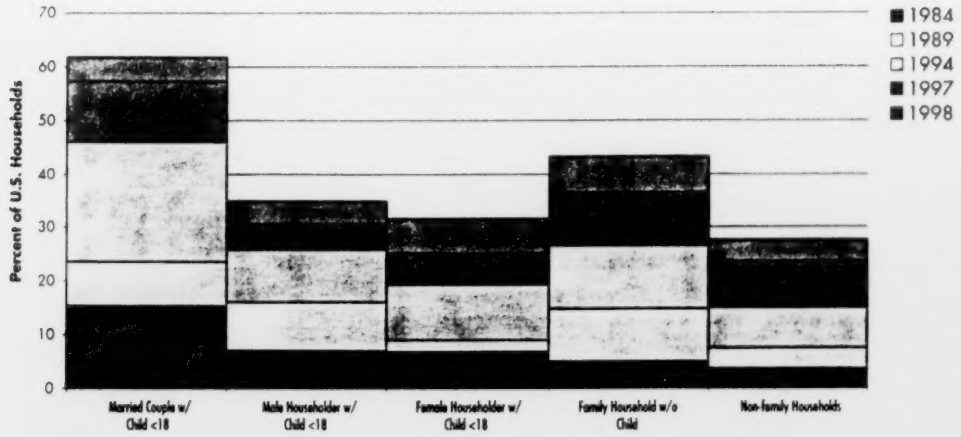
Chart A-13:

Percent of U.S. Households with Computers

By Household Type

1984-1998 (Selected Years)



Household Type	1984	1989	1994	1997	1998
Married Couple w/ Child <18	15.4	23.7	46.0	57.2	61.8
Male Householder w/ Child <18	6.9	16.1	25.8	30.5	35.0
Female Householder w/ Child <18	6.7	9.1	19.3	25.0	31.7
Family Household w/o Child	5.1	14.8	26.6	36.4	43.2
Non-family Households	3.7	7.6	15.0	23.5	27.5

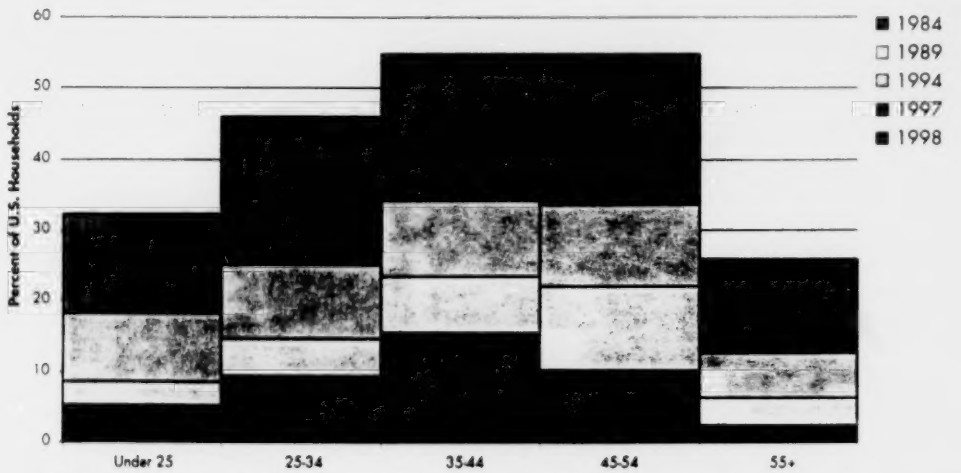
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

Chart A-14:

Percent of U.S. Households with Computers

By Age

1984-1998 (Selected Years)



Age	1984	1989	1994	1997	1998
Under 25	5.1	8.5	18.1	28.0	32.3
25 - 34	9.4	14.5	25.1	40.0	46.0
35 - 44	15.5	23.5	34.1	49.0	54.9
45 - 54	10.2	22.0	33.6	48.0	54.7
55+	2.5	6.4	12.7	21.0	25.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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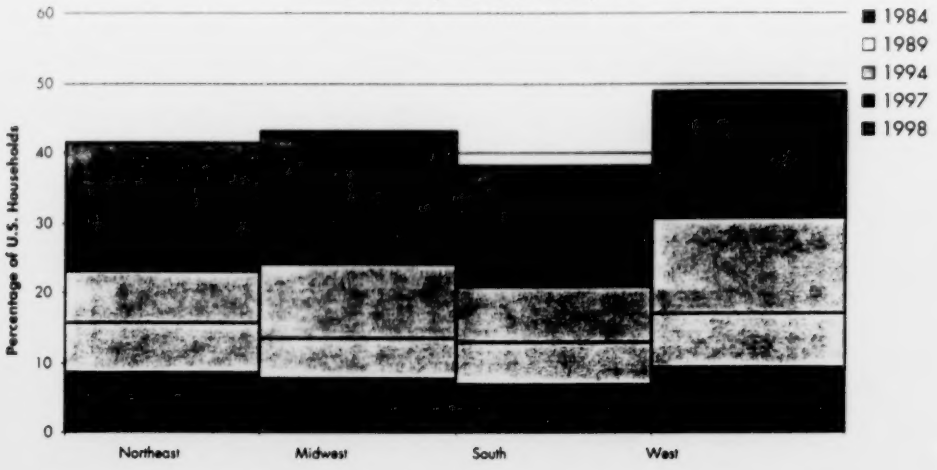
Chart A-15:

Percent of U.S. Households with Computers

By Region

1984-1998 (Selected Years)



Region	1984	1989	1994	1997	1998
Northeast	8.5	15.5	22.9	35.2	41.3
Midwest	7.7	13.5	24.1	36.5	42.9
South	6.9	12.9	20.9	33.4	38.0
West	9.2	17.1	30.6	43.4	48.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

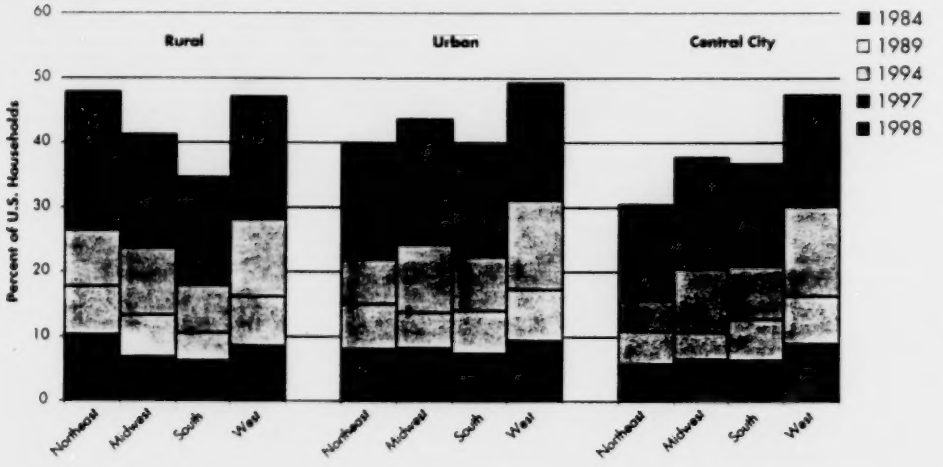
Chart A-16:

Percent of U.S. Households with Computers

By Region

By Rural, Urban and Central City Areas

1984-1998 (Selected Years)



Region	Rural					Urban					Central City				
	1984	1989	1994	1997	1998	1984	1989	1994	1997	1998	1984	1989	1994	1997	1998
Northeast	10.2	17.7	26.3	41.7	47.8	8.1	14.9	21.9	33.4	39.5	5.8	10.8	15.6	24.7	30.4
Midwest	6.7	13.3	23.6	36.2	41.1	8.2	13.6	24.2	36.7	43.6	6.5	10.6	20.5	31.1	37.7
South	6.2	10.5	17.9	30.2	34.6	7.3	14.0	22.3	34.8	39.6	6.4	12.6	20.9	31.1	36.7
West	8.5	16.1	28.0	40.3	47.0	9.3	17.3	31.1	43.9	49.2	8.9	16.3	30.1	42.9	47.4

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1984, November 1989, November 1994, October 1997, and December 1998 Current Population Surveys.

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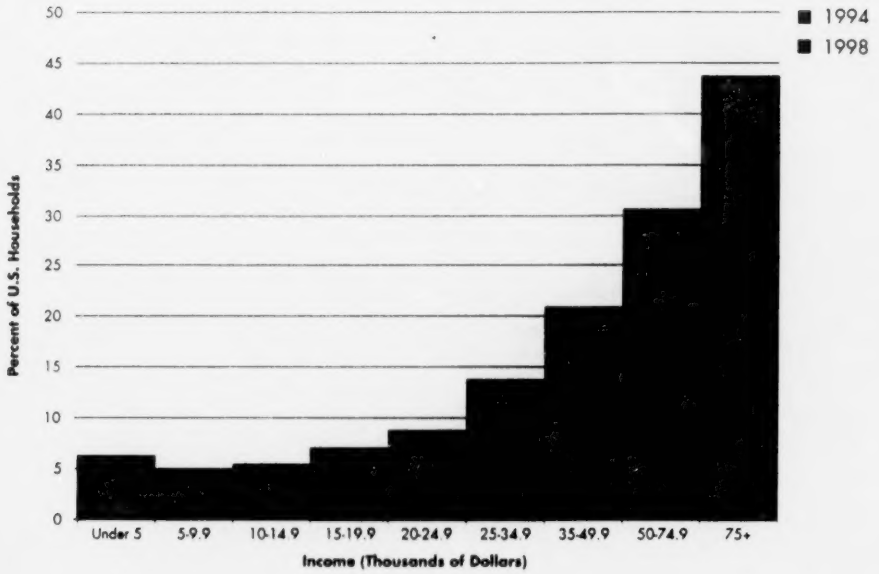
Chart A-17:

Percent of U.S. Households with E-Mail

By Income

1994-1998



Household Income	1994	1998
Under $5,000	1.5	6.2
5,000 - 9,999	0.9	4.8
10,000 - 14,999	1.2	5.5
15,000 - 19,999	1.3	7.1
20,000 - 24.999	1.7	8.7
25,000 - 34,999	2.5	13.8
35,000 - 49,999	4.2	21.0
50,000 - 74,999	6.5	30.6
75,000+	10.3	43.7

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

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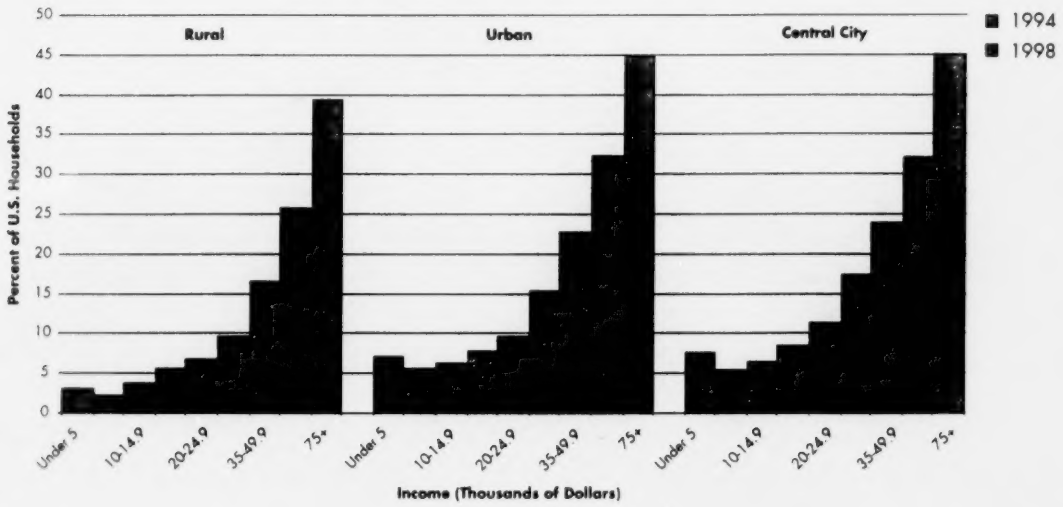
Chart A-18:

Percent of U.S. Households with E-Mail

By Income

By Rural, Urban and Central City Areas

1994-1998



Household Income	Rural		Urban		Central City	
	1994	1998	1994	1998	1994	1998
Under $5,000	0.5	3.0	1.8	7.0	2.1	7.5
5,000 - 9,999	0.0	2.1	1.2	5.6	1.4	5.3
10,000 - 14,999	0.5	3.7	1.4	6.2	1.8	6.3
15,000 - 19,999	0.9	5.6	1.5	7.7	1.6	8.4
20,000 - 24.999	0.8	6.7	2.0	9.5	2.6	11.3
25,000 - 34,999	1.3	9.5	3.0	15.3	3.5	17.3
35,000 - 49,999	3.4	16.4	4.5	22.7	5.8	23.8
50,000 - 74,999	6.0	25.7	6.7	32.2	6.5	32.1
75,000+	8.7	39.3	10.8	44.8	10.3	45.0

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

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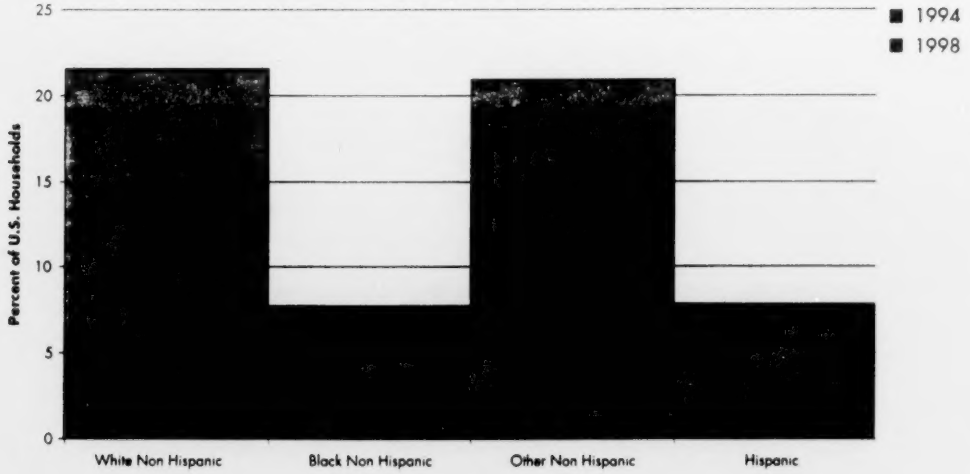
Chart A-19:

Percent of U.S. Households with E-Mail

By Race/Origin

1994, 1998



Race/Origin	1994	1998
White Non Hispanic	3.8	21.5
Black Non Hispanic	1.1	7.7
Other Non Hispanic	5.8	20.9
Hispanic	1.5	7.8

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

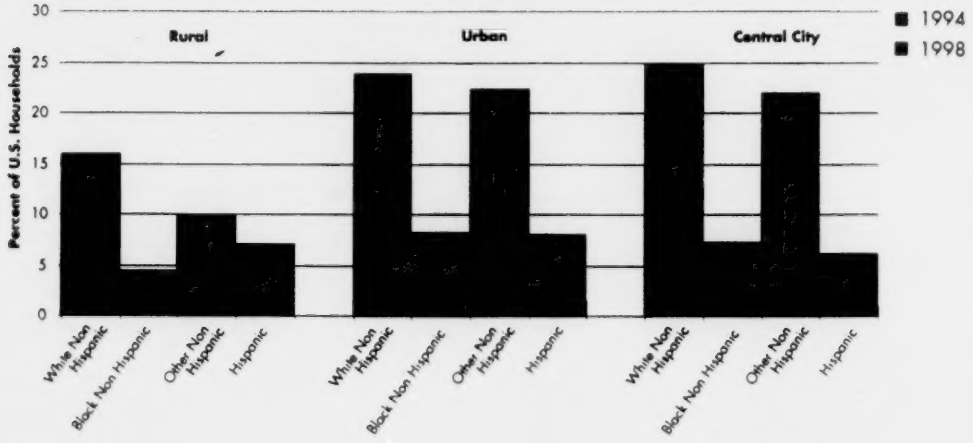
Chart A-20:

Percent of U.S. Households with E-Mail

By Race/Origin

By Rural, Urban and Central Cities

1994, 1998



Race/Origin	Rural		Urban		Central City	
	1994	1998	1994	1998	1994	1998
White Non Hispanic	2.5	15.9	4.3	23.8	4.9	24.8
Black Non Hispanic	0.6	4.3	1.2	8.1	1.0	7.1
Other Non Hispanic	2.9	9.8	6.2	22.3	5.9	21.8
Hispanic	2.1	6.9	1.5	7.9	1.0	6.1

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

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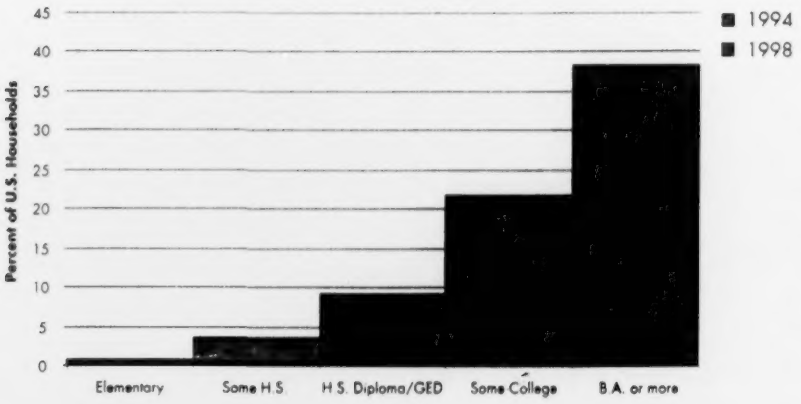
Chart A-21:

Percent of U.S. Households with E-Mail

By Education

1994, 1998



Education	1994	1998
Elementary	0.2	0.8
Some H.S.	0.4	3.4
H.S. Diploma/GED	1.2	9.2
Some College	3.4	21.7
B.A. or more	8.9	38.3

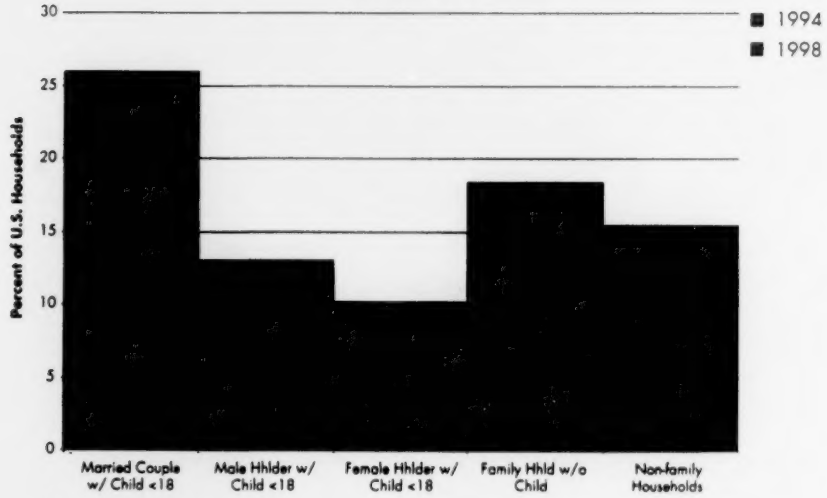
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

Chart A-22:

Percent of U.S. Households with E-Mail

By Household Type

1994, 1998



Household Type	1994	1998
Married Couple w/ Child <18	5.0	25.9
Male Household w/ Child <18	4.1	12.9
Female Household w/ Child <18	1.1	10.1
Family Household w/o Child	3.6	18.3
Non-family Households	2.8	15.4

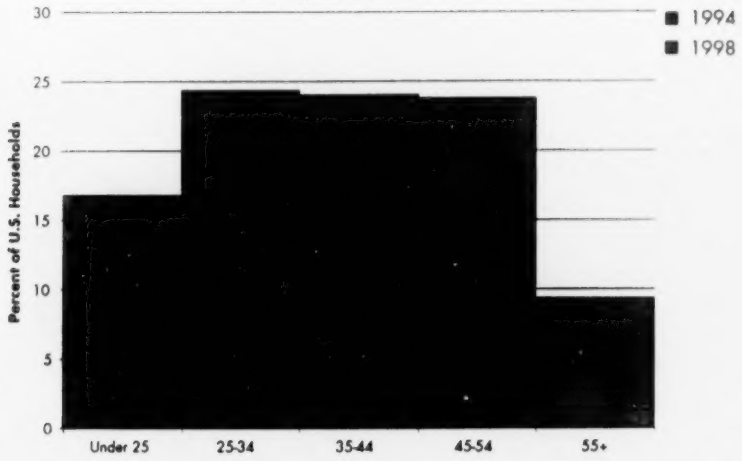
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

Chart A-23:

Percent of U.S. Households with E-Mail

By Age

1994, 1998



Age	1994	1998
Under 25	3.7	16.7
25 - 34	4.3	24.3
35 - 44	4.4	24.0
45 - 54	4.8	23.7
55+	1.3	9.3

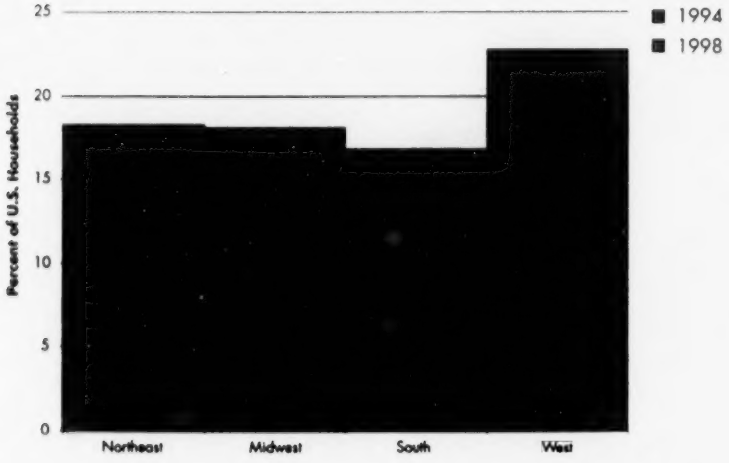
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

Chart A-24:

Percent of U.S. Households with E-Mail

By Region

1994, 1998



Region	1994	1998
Northeast	3.4	18.2
Midwest	3.2	18.0
South	2.8	16.8
West	4.4	22.7

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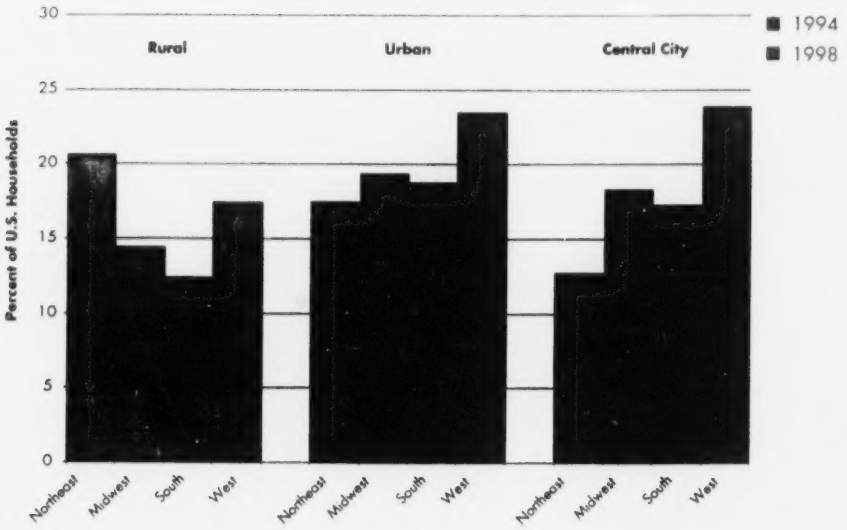
Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

Chart A-25:

Percent of U.S. Households with E-Mail

By Region
By Rural, Urban and Central City Areas

1994, 1998



Region	Rural		Urban		Central City	
	1994	1998	1994	1998	1994	1998
Northeast	4.5	20.6	3.1	17.5	2.8	12.7
Midwest	2.1	14.4	3.6	19.4	3.1	18.3
South	1.7	12.4	3.3	18.8	3.3	17.3
West	2.5	17.4	4.7	23.5	5.1	23.9

Source: National Telecommunications and Information Administration (NTIA) and U.S. Census Bureau, U.S. Department of Commerce, using November 1994, and December 1998 Current Population Surveys.

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GLOSSARY*

AIEA: A race/origin category used by the Census Bureau that consists of American Indians, Eskimos, and Aleuts.

API: A race/origin category used by the Census Bureau that consists of Asian or Pacific Island descent.

B.A.: A "bachelor of arts" degree. A B.A. is earned at a college or university and requires three or more years of full-time study, or part-time equivalent, in a prescribed course of undergraduate curriculum designed to prepare the student for professional work or graduate study. B.A. is also used here to stand for any four-year college degree, such as a "bachelors of science" degree (B.S.).

Black Non Hispanic: A race/origin category used by the Census Bureau that consists of persons who identified their race as "Black," but did not identify themselves as being of Hispanic origin or descent.

Central City: A central city is the largest city within a "metropolitan" area, as defined by the Census Bureau. Additional cities within the metropolitan area can also be classified as "central cities" if they meet certain employment, population, and employment/residence ratio requirements.

Community Access Center: A public place where a local community can use computers, the Internet, or other new technologies. Community access centers can include libraries, schools, community centers, and other public access points. Communities may vary as to which public access points serve as community access centers.

Computer: A "computer" is defined for Current Population Surveys as a personal or home workstation having a typewriter-like keyboard connected to a laptop computer, mini-computer, or mainframe computer.

E-mail: The digital transmission of a message from one person to another using a communications network.

Employed: Employed persons comprise (1) all civilians who, during the survey week, do any work at all as paid employees or in their own business or profession, or on their own farm, or who work 15 hours or more as unpaid workers on a farm in a business operated by a member of the family; and (2) all those who have jobs but who are not working because of illness, bad weather, vacation, or labor-management dispute, or because they are taking time off for personal reasons, whether or not they are seeking other jobs. Each employed person is counted only once. Those persons who held more than one job are counted in the job at which they worked the greatest number of hours during the survey week. If they worked an equal number of hours at more than one job, they are counted at the job they held the longest.

Family: A family is a group of two persons or more (one of whom is the householder) residing together and related by birth, marriage, or adoption.

Family Household: A family household is a household maintained by a family (as defined above), and may include among the household members any unrelated persons who may be residing there. The number of family households is equal to the number of families. The count of family household members differs from the count of family members, however, in that the family household members include all persons living in the household, whereas family members include only the householder and his/her relatives.

Hispanic Origin: Persons of Hispanic origin are determined through self identification by origin or descent. Persons of Hispanic origin are those who indicated that their origin was Mexican-American, Chicano, Mexican, Mexicano, Puerto Rican, Cuban, Central or South American, or other Hispanic.

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Household: A household consists of all the persons who occupy a house, an apartment, or other group of rooms, or a room, which constitutes a housing unit. A group of rooms or a single room is regarded as a housing unit when it is occupied as separate living quarters; that is, when the occupants do not live and eat with any other person in the structure, and when there is direct access from the outside or through a common hall. The count of households excludes persons living in group quarters, such as rooming houses, military barracks, and institutions. Inmates of institutions (mental hospitals, rest homes, correctional institutions, etc.) are not included in the survey.

Householder: The householder refers to the person (or one of the persons) in whose name the housing unit is owned or rented (maintained) or, if there is no such person, any adult member, excluding roomers, boarders, or paid employees. If the house is owned or rented jointly by a married couple, the householder may be either the husband or the wife. The person designated as the householder is the "reference person" to whom the relationship of all other household members, if any, is recorded.

Internet: A worldwide system of interconnected networks allowing for data transmission between millions of computers. The Internet is usually accessed using Internet Service Providers.

Internet Service Provider (ISP): An organization or company that provides Internet access to individuals or organizations.

Labor Force: For Current Population Surveys, a person is considered in the labor force if he or she is a civilian 15 years of age or older and is defined as being either employed or unemployed (see "Employed" and "Unemployed"). This definition will differ from the official definition of the labor force that takes into account those 16 years of age or older, both civilian and non-civilian, who are classified as either being employed or unemployed.

Modem: A modem is defined as a device used to connect the computer to a telephone line, often for the purpose of connecting to on-line services. A modem can either be located internally in the PC, or can be an external device.

Non-Family Household: A non-family household is defined as a household maintained by a person living alone or with non-relatives only.

Other non Hispanic: A race/origin category used by the Census Bureau that includes Asians/Pacific Islanders, American Indians, Eskimos, and Aleuts, but not White non Hispanics or Black non Hispanics.

Rural: All areas not classified by the Census Bureau as urban are defined as rural and generally include places of less than 2,500 persons.

Unemployed: Unemployed persons are those civilians who, during the survey week, have no employment but are available for work, and (1) have engaged in any specific job seeking activity within the past 4 weeks such as registering at a public or private employment office, meeting with prospective employers, checking with friends or relatives, placing or answering advertisements, writing letters of application, or being on a union or professional register; (2) are waiting to be called back to a job from which they had been laid off; or (3) are waiting to report to a new wage or salary job within 30 days.

Urban: The "urban" category includes those areas classified as being urbanized (having a population density of at least 1,000 persons per square mile and a total population of at least 50,000) as well as cities, villages, boroughs (except in Alaska and New York), towns (except in the six New England States, New York, and Wisconsin), and other designated census areas having 2,500 or more persons.

WebTV®: WebTV® is the most widely used system for accessing the Internet through television sets. A WebTV® unit connects to a television set, much like a VCR, and to a telephone line to send and receive data. This data is then displayed on the television, rather than a computer monitor. WebTV® Networks, Inc. is a subsidiary of the Microsoft Corporation.

White Non Hispanic: A race/origin category used by the Census Bureau that consists of persons who self identified their race as "White," but did not identify themselves as being of Hispanic origin or descent.

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* This glossary is a compendium of terms used by the U.S. Department of Commerce's Census Bureau and the National Telecommunications and Information Administration (NTIA).

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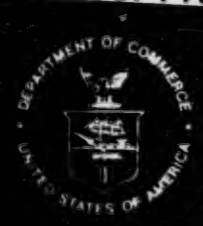

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